FOOD ENGINEERING

June 1951

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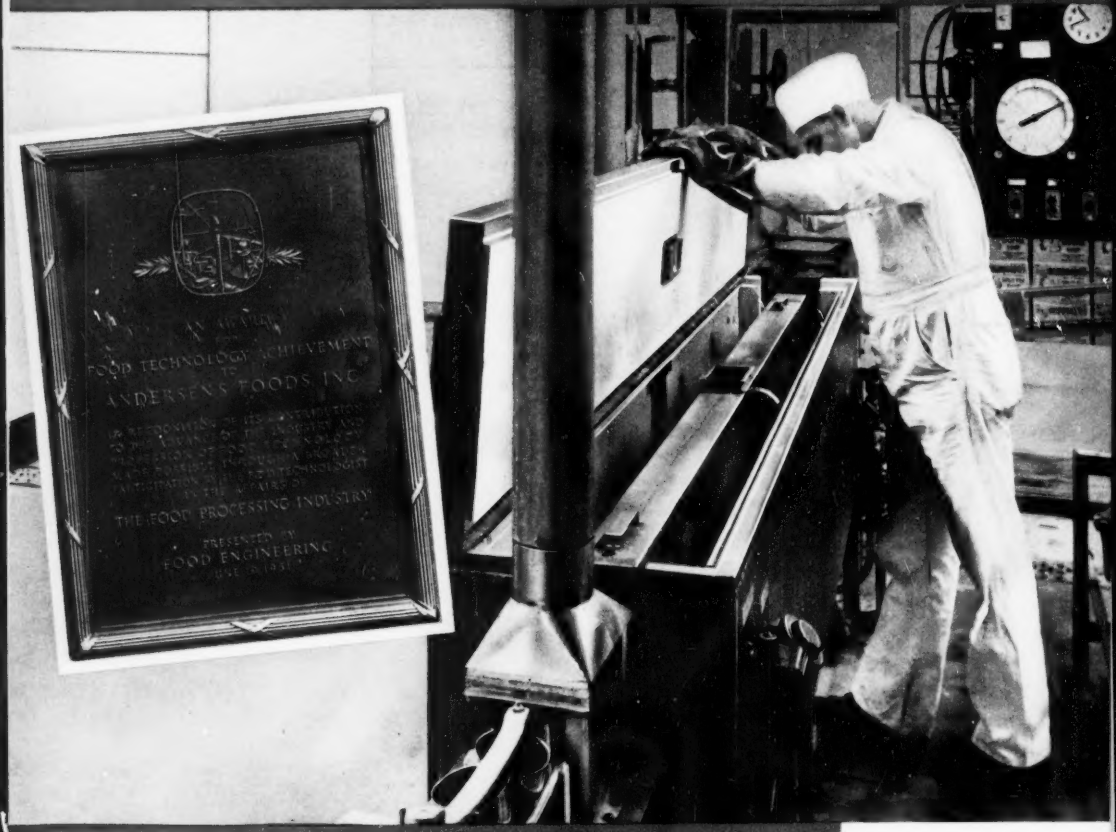
35 CENTS



FOOD ENGINEERING Award goes to canner for application of revolutionary short-time aseptic process. (Page 67)

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PRACTICAL IDEAS

That Solve Plant Problems

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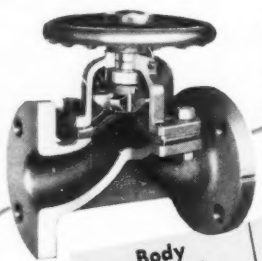
WHAT WOULD **YOU** SPECIFY . . .

Fluid	Concentration	Temp.	Type of Valve	Valve Material
1 Sulphuric Acid	20%	120 F.		
2 Sulphuric Acid	100%	180 F.		
3 Hydrochloric Acid	32%	80 F.		
4 Hydrofluoric Acid	50%	125 F.		
5 Beer		200 F.		
6 Oxygen		Ambient		

In several of these cases other body materials or diaphragms would serve as well. But the really important fact is the unmatched versatility of Grinnell-Saunders Diaphragm Valves in handling corrosive fluids, gases, compressed air, food and suspended solids . . . in lines where corrosion, abrasion, contamination, clogging, leakage and maintenance are problems.

Grinnell-Saunders Valve bodies are stocked in cast iron, malleable iron, stainless steel, bronze, and aluminum, with other materials available on special order. Valve bodies can be lined with lead, glass, natural rubber or neoprene. Diaphragms are available of natural rubber and a number of synthetics to suit particular service conditions.

The Grinnell-Saunders Valve Division will be pleased to submit recommendations upon receipt of complete information covering service conditions.



We supplied Grinnell-Saunders Diaphragm Valves with . . .

Body Material	Diaphragm Material
1 Rubber lined	Natural rubber
2 Cast iron	KEL-F
3 Glass lined	Butyl
4 Magnesium	KEL-F
5 Polished bronze	White diaphragm
6 Cast iron*	Neoprene

*For oxygen service a low flash point lubricant is supplied. All valves for oxygen service are subjected to 300 lb. air underwater test.

Features of the Grinnell-Saunders Diaphragm Valve

- diaphragm absolutely isolates working parts from fluid
- diaphragm lifts high for streamlined flow in either direction
- diaphragm presses tight for positive closure
- body, lining and diaphragm materials to suit service
- simple maintenance—diaphragm easily replaced

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Food Engineering

Volume 23 JUNE, 1951 Number 6

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FOOD ENGINEERING
(Formerly Food Industries)
June, 1951 • Vol. 23, No. 6
Member ABC and ABP

Published monthly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder, **Publication Office 99-129 N. Broadway, Albany 1, N. Y.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President. Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Food Engineering — Subscription Service, 99-129 N. Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 18, N. Y. Allow ten days for change of address.

Please indicate position and company connection on all subscription orders.

Single copies 35c. Subscription rates—United States and possessions $2 for 1 yr., $3 for 2 yr., $4 for 3 yr. Canada, $3 for 1 yr., $4 for 2 yr., $5 for 3 yr. Pan American Countries, $5 for 1 yr., $8 for 2 yr., $10 for 3 yr. All other countries, $15 for 1 yr., $25 for 2 yr., $30 for 3 yr. Entered as second class matter August 26, 1948, at the Post Office at Albany, N. Y. under Act of Mar. 3, 1879. Printed in U.S.A. Copyright 1951 by McGraw-Hill Publishing Co., Inc. — All Rights Reserved.

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NON-STOCK SHEAVES — These sheaves are made to order from stock patterns for A, B, C, D, or E belts, 1 to 1000 hp. For further information check with your *Texrope* drive dealer or Allis-Chalmers Sales Office.

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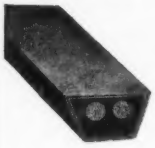

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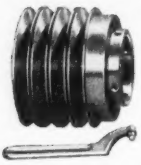

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***MAGIC-GRIP* SHEAVES**— Fastest mounting sheave you can buy. Aligns easily . . . cannot shake loose. 1 to 12 grooves for A-B, B, C, and D belts. 1 to 250 hp. Stocked in many cities for immediate delivery.

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***VARI-PITCH* SPEED CHANGER**—Smooth, accurate speed control at turn of hand wheel. Machines operate at exactly the speed for best production. Stepless speed range: 3¾ to 1. Capacity: 1½ to 75 hp.

YOU CAN GET every V-belt drive component from the *Texrope* line: Constant speed drives; standard and wide range *Vari-Pitch* drives; speed changers; motor bases; and new or replacement long lasting *Super-7* V-belts.

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In addition, you get extra engineering skill both in the field and factory that comes from having more industrial V-belt installations than any other manufacturer.

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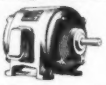

MOTORS — ½ to 25,000 hp and up. All types.

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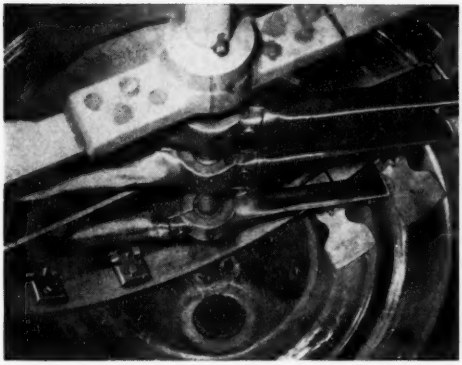
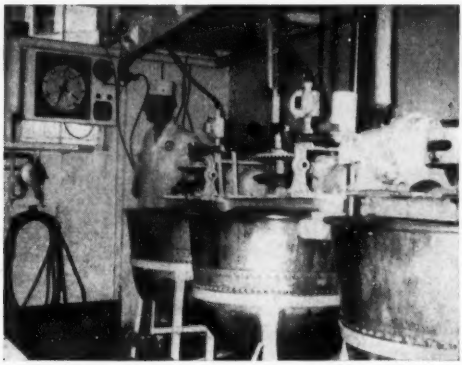
PRACTICAL IDEAS





Notes Temp in Fully-Agitated Kettles

Savings as substantial as $25 per day per kettle in preserve cooking are estimated through use of a technic which employs a thermocouple and an easy-to-read electronic temperature recorder. And product quality is also reported more uniform.

Using a kettle equipped with a full-area agitator (photo left), it has been extremely difficult to secure a precise, continuous temperature record—and control—of the cook.

Good agitation requires that every part of the batch is being stirred. Thus, any thermometer bulb or thermocouple that is inserted in the unit is likely to either shear in two or jam the motor. General practise has been to periodically stop the agitator and take a spot reading—hardly a substitute for dynamic measurement.

To get around this, a small-gage, stainless steel-enclosed thermocouple was located to protrude up into the discharge pipe (left photo) of the kettle. The sensitive tip of this couple was allowed to come flush with the kettle surface, thus avoiding contact with the agitator, but providing a good sampling point for product temperature.

Several kettles were equipped in this manner, with thermocouple leads all running to a centrally located, easy-to-read electronic temperature recorder (right photo). A rotary switch mounted on the panel permits selection of the kettle being fired.

A good spotcheck on the accuracy of kettle-located 'couples was provided by hooking up a test "dunking" thermocouple to one of the switch points. The instrument could thus be briefly connected to this test point during a cook and the reading of the kettle unit verified.

Unexpected gains have come from this simple "defeat" of the agitator. Using the instrument as a "guide" to endpoint in preserve cooking resulted in consistent control of solids content to within ¼ deg. Balling—where the previous tedious use of a hand refractometer would rarely better 1 deg.

Get the Most From Your War-Time Cans

To conserve tin, NPA Order M-25 reduced the weight of tin coatings specified for various products.

These reduced-weight tin coatings provide containers which, under proper conditions of handling, storage, and distribution, should give satisfactory service from the standpoint of both internal and external corrosion.

Regardless of the weight of coatings, certain precautions are necessary to secure the maximum service from the container. As the coatings on these cans is decreased, these precautions become increasingly important. Some of the more important for prevention of external rusting are:

1. Minimize abrasion of coating in can tracks, runways, twisters, retorts, cooling canals and unscramblers.
2. Avoid excessively sharp and deep code embossing. Keep male and female type in exact alignment.
3. Wash sealed cans immediately after closing. Remove salt or acid brines from exterior surfaces. Eliminate excessively high concentrations of alkaline detergent solutions in washing grease from sealed cans. Rinse cans in fresh water immediately after detergent sprays.
4. Vent air from steam retorts rapidly and completely at beginning of process.
5. In boiling-water processes, be sure water is at boiling point, not merely "rolling."
6. Apply chemical treatment to cooling water that is acid, saline or heavily charged with air.
7. Leave just sufficient heat in cans after water cooling to dry all residual moisture from surface before casing.
8. Do not case wet cans or allow water to remain on them for extended periods. Cooling water must be drained from the cans promptly and thoroughly. Use of air or steam blast to remove excess water from tops is advisable.
9. Provide dry and sheltered storage space for all cans—filled and empty. Do not store covers on canning room floor. Cover unprotected cans with a tarpaulin or heavy paper.
10. Prevent sweating of cans by avoiding sudden changes in warehouse temperatures and by proper ventilation. Maintain uniform, low humidities.

Control of Internal Corrosion

Some types of thermally sterilized foods eventually become unmerchantable through reaction with the container. Shelf-life depends upon the nature of the product, the corrosion resistance of the container, and the control of conditions conducive to corrosion.

Can manufacturers are doing their part. To supplement this effort, care should be taken by the canner to insure the maximum storage life of these cans by careful consideration of factors which influence the life of canned food products. The canner should—

Why it pays to standardize on the Link-Belt BULK-FLO . . . .

The BULK-FLO feeds . . . conveys . . . elevates, providing more profitable handling of hundreds of materials

Difficult-to-handle bulk materials are moved safely and economically with the Bulk-Flo. The Bulk-Flo, most versatile type of conveying medium on the market, serves as a feeder, conveyor and elevator under one drive. The same unit can combine horizontal, vertical and inclined paths, often replacing several units, in less space and at lower cost. Multiple feed and discharge points are practicable. It is completely enclosed—dust tight.

Operating independent of internal pressure, the Bulk-Flo, *with solid flights*, need not be operated at full capacity to provide positive movement of materials. Regardless of the amount of feed, it is self-clearing.

Bulk-Flo provides gentler handling. Because of its solid flights, there are no annoying updrafts of air. Avalanching is eliminated. Variable speed drives are not necessary, because the capacity can be varied by regulating the feed.

You can be sure, when our specialists recommend Bulk-Flo to your engineers or designing contractor, that it is the *right* conveying system for your needs, because Link-Belt makes *all types* of feeding, conveying and elevating machinery—the only complete line on the market today. For all the facts, write for Book 2175.

Full or partially loaded, Link-Belt Bulk-Flo with solid flights provides positive, gentle material handling.

Food handling is easier and safer with BULK-FLO

- Unit is self-clearing, through intermediate runs.
- Dust-tight construction.
- Handles batches on cycle operations.
- No contamination from lubrication.
- Chain and casings can be galvanized or tin-dipped to prevent rust, or made of alloy metals.

Standard combined-run, L-path arrangement Bulk-Flo with single feed opening and front-discharge head section. Side discharge head section may also be used.

LINK-BELT

BULK-FLO
FEEDERS - CONVEYORS - ELEVATORS

LINK-BELT COMPANY: Chicago 8, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in Principal Cities. 32.382

1. *Avoid overfilling and underfilling.* Proper fill delays hydrogen springer formation in that it provides a reasonable headspace that acts as a reservoir for gas evolved in the corrosion process. Value here is largely lost however, if this reservoir is not exhausted of air and other gases, with a good vacuum established in the can.

2. *Eliminate air before closing.* Every effort should be exerted to minimize the volume of air entrapped in the sealed can. Exact procedure varies with product but may involve adequate presoaking, blanching, as well as good thermal or mechanical exhausting. Syrups and brine should be boiled prior to use and should be added as hot as possible.

3. *Provide adequate cooling.* Immediately after sterilization, cans should be rapidly cooled until only enough heat remains to dry containers and prevent rust. Preferred method is to cool in water to 95-105 deg. F. Then allow to air-dry before casing. Do not case cans at temperatures above 95 F.

4. *Maintain cool storage temperatures.* Corrosion is a chemical reaction. Rates of most chemical reactions approximately double with each 18 deg. F. increase in temperature. Thus, service life of cans can be increased greatly by low storage temperatures.

It is important that canners maintain the coolest storage conditions possible in order to provide as large a margin of safety as possible after the goods leave their hands.—*From "How to Obtain Best Service From Food Cans," booklet distributed by Can Manufacturers Institute, Washington, D. C.*

$50 EXTRA FOR BEST ITEM

You are invited to submit Practical Ideas. You will be paid at regular rates when your item is printed and if it is judged best for the month you will get an additional payment of $50.

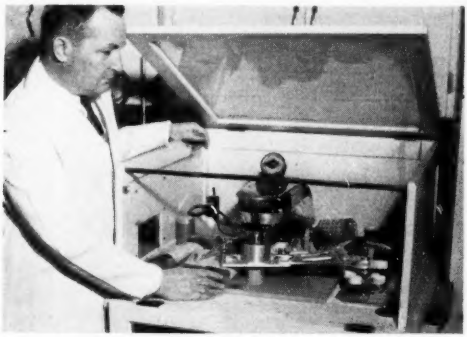
Selection of the best contributed item will be made by a group of 200 readers each month, and the item title and author's name will be cited (see below).

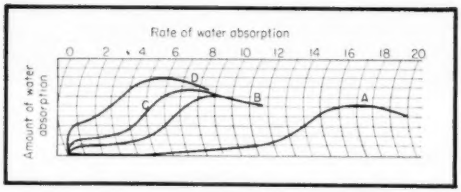
Practical Ideas may describe any type of device or method recently developed to solve a problem, speed an operation, or make some task easier. They may concern factory, laboratory, warehouse, or power-plant operations in the food industry. Ideas on management, maintenance, and trucking or shipping also are suitable.

You need not be an experienced writer or draftsman to submit these ideas. The text will be edited and sketches converted to finished drawings.

Send your items to: Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 18, N. Y.

APRIL PRACTICAL IDEA voted best was "Avoids Scorching of Vegetable Oils," submitted by J. W. Stockard, Leeds & Northrup Co., and W. K. Harriman, Geare-Marston, Inc., Philadelphia. It describes a margarine maker's special method for unloading vegetable oils from tank cars.





Flour Tester Checks Milk Powders

A new testing technic has been developed which provides the baker with an inexpensive and accurate method for standardizing quality of milk solids—to the point that he can readily and economically increase the amount of these solids in his dough mixes.

Here, the standard Mixograph machine, originally designed to test flours, has been adapted to testing the baker's nonfat milk powders. The method was initiated at the University of California by Dr. Helge Shipstead. Then the Golden State Co., Ltd., of San Francisco, put it to its first practical use in the dairy industry, and this experience led to adjustments and improvements.

The Mixogram curve, derived from the Mixograph, reveals the rate of water absorption of the milk powder, indicates when the dough will reach peak development and elasticity, its rate of weakening and its range of stability towards mixing.

Different lots of milk processed with controlled variations of heat treatment were tested for the purpose of selecting that one which gave optimum results under typical bakery conditions.

Bakers have long expressed fear that levels of milk solids higher than 2 percent will damage bread because of lack of uniformity of the milk. In many instances, poor milk powder quality not evident in a 2 percent mix, has become evident at 4 or 6 percent levels.

Mixograph tests made with specially processed baker's nonfat milk solids revealed that a maximum of 12 to 14 percent of milk in the dough mix was possible. In testing procedures, a proportion of 25 percent milk powder to 75 percent flour was used, since this ratio magnifies any fault in the milk powder.

Higher milk solids in bread improve the product's flavor as well as nutrition. Impartial tests have revealed that a 6 percent loaf stays fresher about ⅓ longer than a 2 percent loaf under similar conditions. This fact reduces the need for alginates and emulsifiers in the dough. This type of loaf also makes a browner, moister toast.

Specially processed baker's milk powders that meet the Mixograph test, provide more uniformity in dough development and thus help the baker set more accurate schedules for mixing, proofing, loaf forming and oven operation. By making bread "slow-bake" better, they give the baker more freedom in oven adjustments. The Mixograph test for milk powder can be used to advantage right in the bakery, since it eliminates the need for costly and time-consuming bake tests, now common in large operations.

If a milk powder meets baker's requirements as indicated by the Mixogram curve, the baker need make only minor changes in the sugar and water content of his formula in order to bake a 6 percent milk loaf.

An accompanying illustration shows Mixogram curves derived from a simplified "dough" made of milk powder,

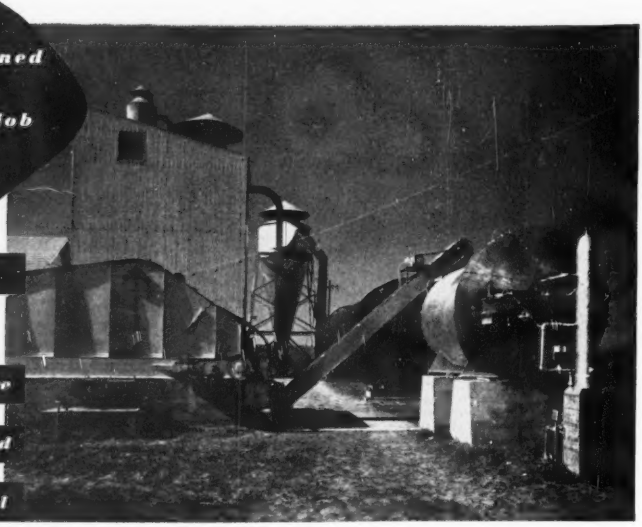
See Louisville for

CREATIVE DRYING ENGINEERING

New Louisville "Type H" dryer retains higher carotene content at low cost

Gives you a premium product to sell at ordinary prices

Designed to do your job best!



For a Variety of Products

Dry chopped alfalfa • Shredded sweet potatoes
White potato meal • Beet pulp,
many other root crops

High Capacity—Low Temperature

Complete Plant Can Be Furnished

No Flame Contact with Material

Keep that carotene to make more money! The Louisville "Type H" Dryer was developed to retain the maximum possible carotene value in chopped alfalfa while drying at high production rates. Its notable success with chopped alfalfa is repeated in the handling of a variety of feedstuffs including sweet potatoes and other root crops.

Behind this success story is a history of more than 50 years in the designing and building of Louisville Dryers to meet the widely varying needs of industry. Write for new "Type H" Dryer Bulletin.

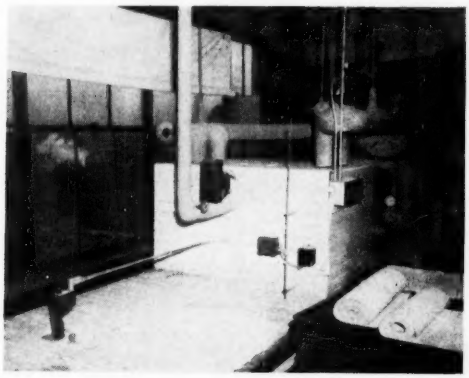
Other General American Equipment:
Turbo-Mixers, Evaporators, Thickeners, Dryers, Towers, Tanks, Bins, Filters, Pressure Vessels

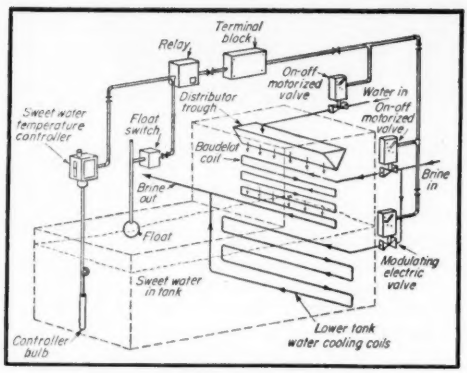
PROCESS EQUIPMENT DIVISION
GENERAL AMERICAN
TRADE MARK

Louisville Drying Machinery Unit
Over 50 years of creative drying engineering
GENERAL AMERICAN TRANSPORTATION CORPORATION
Dryer Sales Office: Hoffman Bldg., 139 So. Fourth Street
Louisville 2, Kentucky
General Offices: 135 South La Salle Street, Chicago 90, Illinois
Offices in all principal cities

flour, salt and water. Sample "A", a milk powder given short-time, low-heat treatment, is shown to have comparatively low water absorption properties and a slow rate of water absorption. Sample "D", a "dough" mixture made from specially processed milk powder given long-time high-heat treatment, shows appreciable increase in water absorption properties over samples "B" and "C" containing milk powders currently in use in bread.

Mixogram curves derived from these simplified dough mixtures also reveal the properties of the complete dough in that they accurately interpret peak elasticity, rate of dough weakening, and range of stability of the dough.—*Dr. C. A. Kempf, Research Supervisor, Golden State Co., Ltd., San Francisco.*





Takes Burden Off Compressor

By installing a few inexpensive control devices and hooking in a simple trickle cooler we have eased the strain on our compressor during peak hours of processing in the plant.

Here is the story: When our bake shop production was expanded recently, we discovered that the present compressor was unable to properly chill enough sweet water for the dough mixers. A secondary brine system was being used to cool this water, with a fairly small flow of 20-deg.-F. brine. We found it wasn't feasible to add more tonnage in this system.

After much thought it was decided to arrange a water cooler storage system that would effectively spread our refrigeration load over 24 hr., thereby taking the burden off our compressor during peak hours of production.

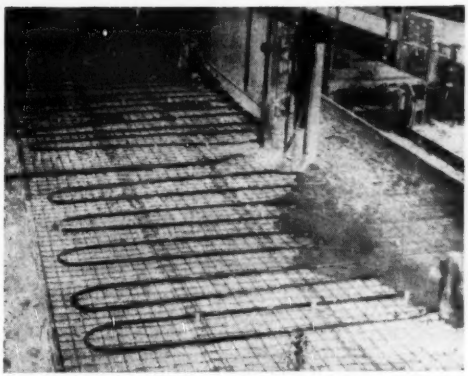
To accomplish this, a small Baudelot cooler was put in above the sweet water chill tank (see sketch). This allowed prechilling of water as it trickled into the tank. A float level control was placed in the main tank to stop the flow of water and brine to this small trickle cooler when the maximum storage level was reached.

A non-indicating temperature controller was then installed with its bulb immersed in tank-held sweet water. A control temperature of 40 deg. F. was set on this unit. Deviation from this temperature would allow the controller to operate an electrically driven modulating valve in the brine line to the storage tank. Thus, small changes in sweet-water temperatures resulted in proportionate changes in the rate of cooling brine flow.

During the day's operations, sweet water is drawn heavily from its storage tank. However, capacity is such that the tank's contents are never depleted.

Then, at night, when there is no heavy demand on the plant's refrigeration system, the trickle cooler effectively fills the storage tank with chilled water over a period of hours.

When tank capacity is reached, the float causes the trickle-feed system to shut off. Sweet water is then placed under automatic supervision of the temperature controller and main brine chilling coils.—*Warren Lancaster, Assistant Plant Engineer, Robert A. Johnston Co., Milwaukee.*



Radiant Heating Solves "Sticky" Problem

At the raw sugar terminals of a Southern cane refinery, engineers solved a real poser with the installation of radiant heating.

The combination of spilled sugar particles and condensation from the atmosphere had created what was—literally—a sticky problem.

For a long time the refinery—located at a deep water port where humidity ranges quite high—had been plagued by the presence of moisture on the floors in the raw sugar warehouses. These floors consisted of concrete covered with ¼-in. steel plates. Cold-weather "sweating", particularly after a warm humid night, created a hazard; for with the inevitable spilling, particles of sugar would gum-up under foot and make the area dangerous to work in.

Engineers decided the job couldn't be tackled by half-hearted measures. They ripped up the old floor, installed radiant heating coils of 1-in. wrought iron pipe (see illustration above), and laid a new floor over them. These pipes carry hot water, regulated to keep the floor slab at a temperature 5 to 8 deg. warmer than the outside.

The installation completely eliminated condensation moisture. And it has now been extended to cover all runways from the wharf to the manufacturing area.—*A. M. Byers Co., Pittsburgh.*

Let You Forget About Atmospheric Hazards

Shown here are four basic types of Century Protected Motors which are designed to resist the dangers of hazardous atmospheres. A properly selected Century motor—with the right protection—is the ideal combination for a long life of satisfactory performance.

1 **Open Protected**—Form J, general purpose motor—meets the needs for most installations where operating conditions are relatively clean and dry. The top half of the motor frame is closed to keep out falling solids or dripping liquids.

2 **Splash Proof Motor**—gives the necessary protection where plants must be washed down—keeps water out of the motor even when a hose is applied directly on the frame. It also provides protection against rain, snow, sleet and ice for outdoor installations.

3 **Totally Enclosed Fan Cooled Motor** — protects against dusts, mist or fog that might be detrimental to the vital parts of the motor. The inner frame protecting the motor is sealed to keep out harmful matter.

4 **Explosion Proof Motor** — protects against atmospheres charged with explosive dusts or gases. They carry Underwriters' label for specific kinds of hazards.

Century builds a complete line of alternating and direct current motors in a wide range of types and kinds—in sizes from 1/6 to 400 horsepower.

Specify Century motors for all your electric power needs.

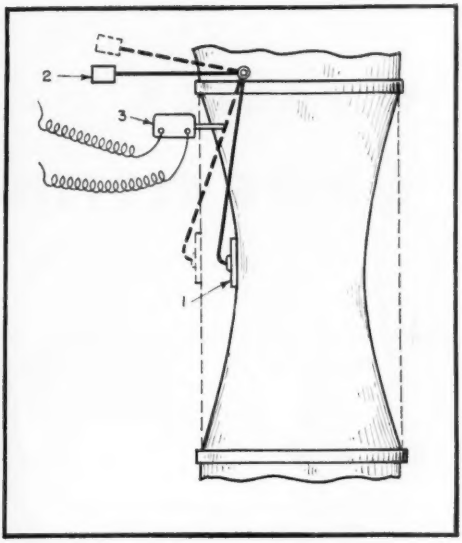
Century Electric Company is celebrating its 50th year in the electrical industry.

-832

Century C MOTORS

CENTURY ELECTRIC COMPANY 1806 Pine Street • St. Louis 3, Missouri

Offices and Stock Points in Principal Cities



Device Improves Filling Operations

Greater accuracy of fill and easier machine cleaning in our QT cake-frosting operations has been attained through use of a control mechanism developed in our own shop at Taylor Reed Co.

In the new assembly, a canvas sleeve replaces a metal duct.

We deliver the frosting to auger type filling machines through a metering tube-type conveyor. When the filling operation is interrupted on any machine, the metering conveyor must be stopped.

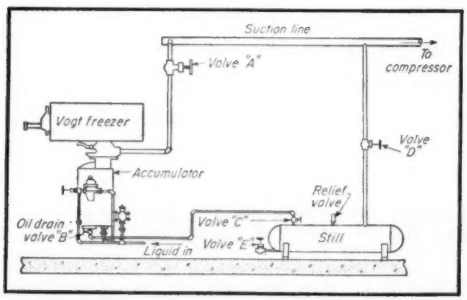
Formerly, the metering tubes ran intermittently, since they were set to over-fill to assure an adequate supply of frosting to the fillers. But in our new continuous operation the control arrangement has proven very satisfactory for keeping augers correctly supplied.

The first move was to replace the metal duct (between the metering screw and the filling mechanism) with a canvas duct (see photo). This change has brought us several advantages. Air tends to vent through the canvas, thus dusting has been reduced. Also, the canvas duct is easy to take off for cleaning when changing flavors, and its removal makes the rest of the machine readily accessible for cleaning. The canvas duct was also necessary for the type of control we now use. Regulation is achieved through the swelling action of the duct, when full.

This control mechanism (see sketch) consists of a small plate (1) on the end of a hinged rod. The plate is held against the canvas duct by a counterweight (2). When the metering screw feeds frosting into the canvas duct, the bag swells, forcing the plate outward. When the duct is sufficiently full, the rod attached to the plate opens the circuit in a snap-switch (3) that controls the motor driving the metering screw.

The motor is started again when the canvas duct is emptied to the point that the plate pressing against it closes the snap-switch.

Accuracy of the fill has been increased, and there have been no failures of this operation to interfere with production.—*W. A. Reed, Plant Engineer, Taylor Reed Co., Glenbrook, Conn.*



Minimizes Oil Problems in Freezers

Installation of a still in the manner shown in the sketch above will reduce oil problems in continuous ice cream freezer operations.

Further, it will enable servicemen to evacuate ammonia from freezers quickly if repairs are necessary. Also, the system will save loss of ammonia, as compared to the usual method of oil purging in a pail of water.

A battery of freezers can be accommodated by a single still, which can be located at any convenient spot. Here is the way to operate the system:

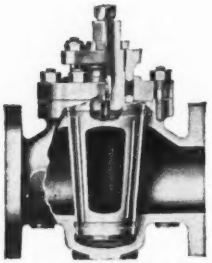
After the freezer has been stopped and the liquid feed valve has been closed, then close valve (A). Next, open valve (B) to permit liquid to flow to the still.

As the ammonia warms up, pressure is created which pushes liquid out of the accumulator. Valves (C) and (D) remain open at all times, except if work has to be done on the still. Oil and impurities can be removed from valve (E) at periodic intervals.

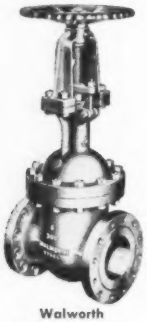
To put the freezer back into service after a shut down, first close valve (B), next open valve (A), and then open the liquid valve.—***Based on item in the "Circle," house organ published by Cherry-Burrell Corp., 427 W. Randolph St., Chicago 6, Ill.***

● VALVES

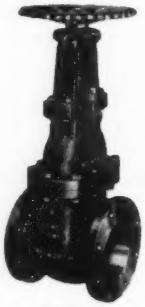
● PIPE FITTINGS



Walworth
Lubricated Plug Valve



Walworth
Steel Gate Valve



Walworth
Iron Body Gate Valve

Walworth
"500 Brinell" Bronze Globe Valve

Walworth
Iron Body Saddle Gate Valve

Walworth
Cast Steel Flanged Fittings

Walworth manufactures a *complete line* of valves and pipe fittings: all made to the highest standards of quality, both as to dimensional accuracy and metallurgical properties. In design, construction, and performance, Walworth products reflect more than a century of experience in the manufacture of quality valves and fittings.

Your Walworth distributor will give you full information on the *complete line* of Walworth steel, iron, and bronze, and special alloy valves and pipe fittings; also Walworth Lubricated Plug Valves, and Walseal* valves, fittings and flanges. Ask for this information today.

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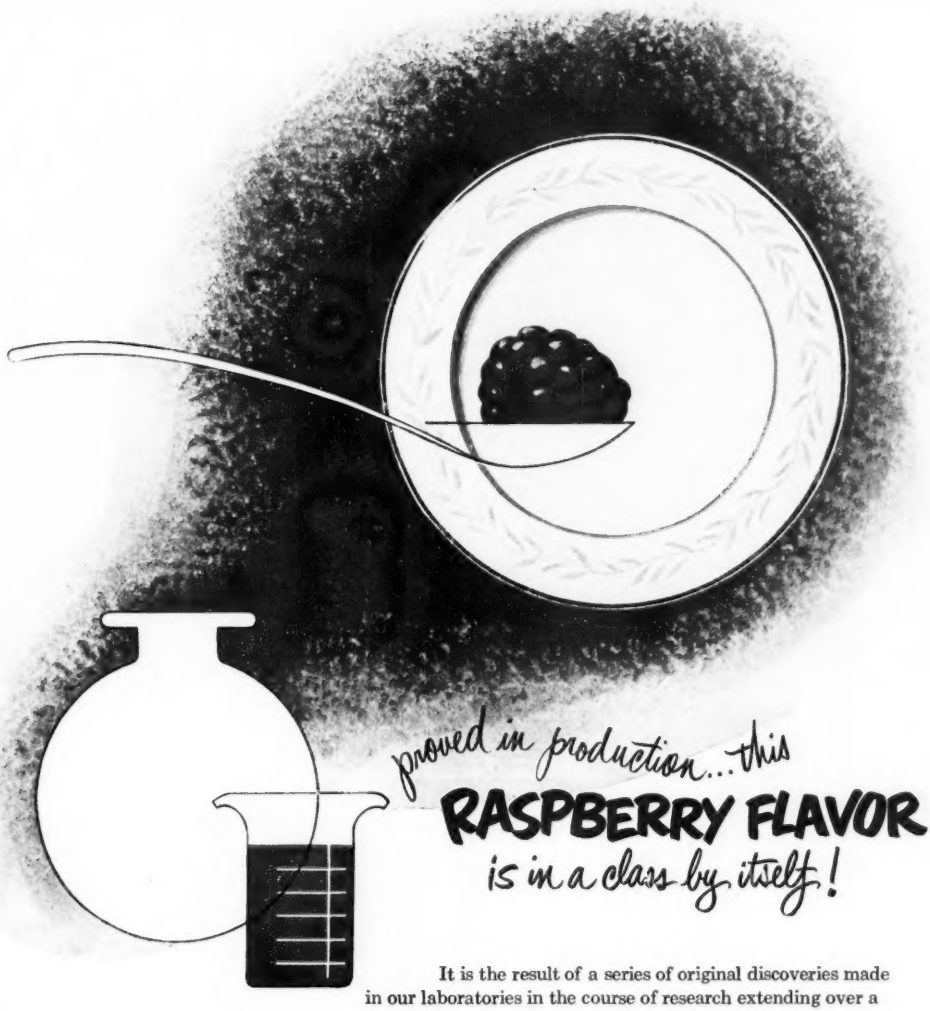

proved in production... this

RASPBERRY FLAVOR

is in a class by itself!

It is the result of a series of original discoveries made in our laboratories in the course of research extending over a period of many years. For the first time the flavor alone of sun-ripened raspberries has been lifted with absolute precision and converted into a tremendously powerful flavor material with physical characteristics specialized for commercial uses. Its absolute uniformity is the result of completely controlled, synthetic construction. Its sure, solid raspberry flavor is the result of systematic research and exact knowledge.

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YOU ARE NEVER FAR FROM CONTINENTAL

Continental Can has 65 plants in the United States, Canada and Cuba, 16 field research laboratories and 63 sales offices.

(This advertisement originally appeared in full-color in TIME, BUSINESS WEEK and FORTUNE.)

Vitamins—

—PRESENT AND ACCOUNTED FOR

Continental research has helped canners preserve vitamins in canned vegetables, fruits and fruit juices

This may surprise you. However, it's a fact that canned foods are just as high in vitamin content as the same foods bought in the market and cooked at home by the housewife.

That's because fruits and vegetables used for canning are picked at their prime and "pressure-cooked" in sealed cans—often within the hour. There's little time for vitamins to escape as they do during the days it usually takes to deliver raw foods to the market.

To make sure that more and more vitamins reach your table, Continental's research scientists have pioneered in studies of the vitamin content and nutritive value of canned foods. They have suggested many specific improvements in canning equipment and procedures to the canning industry. And each year they visit canning plants all over the country to help individual food packers do a better job.

Today when you serve a canned food, you can be sure that the food contains most of the nutritive qualities and vitamins that nature put into it. Continental research has helped bring more food and better food to more people!

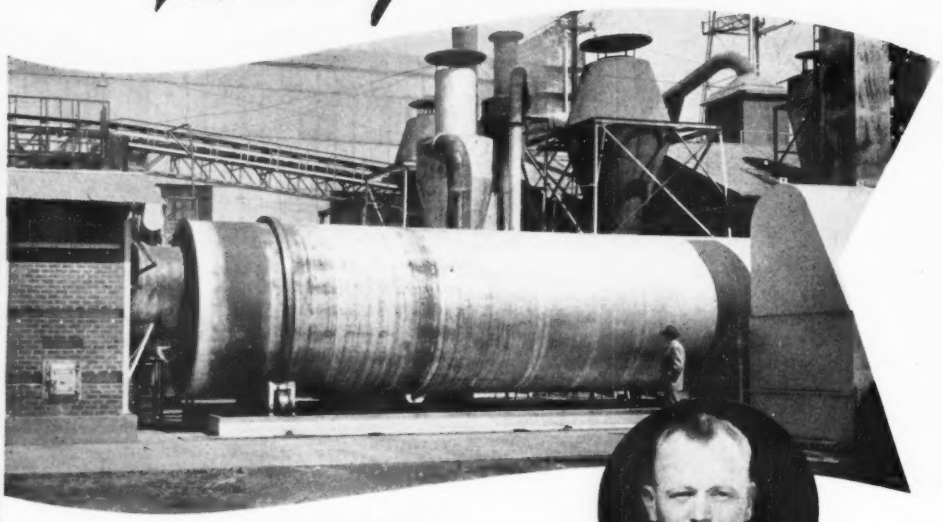
If it's a packaging problem—it's our baby!

If you are a food packer, you will find that the quality and scope of our research service are major reasons why so many people like to do business with Continental Can Company. Our one goal is to lick packing problems of all kinds.

CONTINENTAL CAN COMPANY

100 EAST 42nd STREET NEW YORK 17, NEW YORK

Another STANDARD-HERSEY *Money Maker!*



Low Temperature Dryer turns pulp into extra profits for Sunkist

Sunkist dries orange pulp waste into livestock feed in mountainous quantities. But, in the Sunkist tradition, quality is also important. The feed must be rich in vitamins A, B complex and C—and 78% digestible to cattle.

That is why Sunkist selected the high capacity Standard-Hersey Low Temperature Dryer shown above.

It is designed to process 7 tons of waste per hour—reducing moisture content from 73% to 7%, and producing 2 tons of dry commercial meal.

Yet maximum protection is afforded feed values because low temperature drying assures that the product can never reach a dangerous temperature level.

Let Standard-Hersey advanced engineering solve your drying problem, too. One of America's largest and most complete dryer engineering, planning, and fabricating organizations. "Pilot" plant to predetermine exact drying characteristics of your product. More than 30 types of dryers available in all commercial sizes for every process industry need.

. . . "works fine,"

says Sunkist's James A. Finley, Exchange Orange Products Co. manager, with regard to the new Standard-Hersey Dryer in the Company's Ontario, California plant. Those two short words from a cost conscious expert speak volumes for the high productive efficiency of the Standard-Hersey drying equipment, which consists of furnace house, dryer unit, two cyclones and a dust collector.

STANDARD HERSEY *Dryers*

Send FOR NEW DRYER BULLETIN

Complete illustrated brochure describing principal features and applications of Standard-Hersey Dryers, Kilns, Coolers, and Calciners—write for *Dryer Bulletin No. 508.*

STANDARD STEEL CORPORATION

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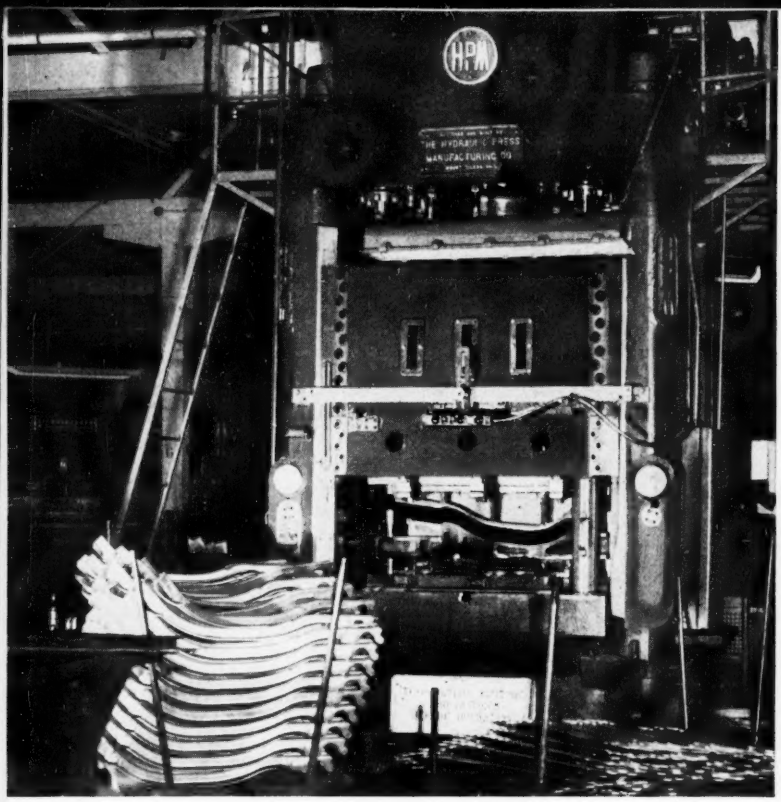

What's YOUR problem?

D. G. Cripps, of Standard Oil's Grand Rapids, Michigan, office, is the Standard Oil lubrication specialist who recommended STANOIL for use in the hydraulic press shown at the left.

Complete familiarity with job requirements and lubrication applications equips a corps of such Standard Oil lubrication specialists throughout the Midwest to handle similar problems for plant operators.

One of these lubrication specialists is near your plant – ready to give you the benefit of his experience and training. You can obtain his services quickly and easily. Just phone or drop a card to the nearest Standard Oil Company (Indiana) office. Ask the lubrication specialist to explain the benefits of such widely accepted lubricants as:

SUPERLA Greases—Available in all consistency grades, SUPERLA Greases cover a wide range of applications. These products are comparable in quality to the highest type of special greases but are as readily available and economical as ordinary cup greases.

CALUMET Viscous Lubricants—On open gears and wire rope, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears and chains, better internal lubrication of wire rope.

STANORUST Rust Preventives—The eight grades of STANORUST form one of the most complete and effective lines of rust preventives on the market today. Each has been scientifically and specifically developed for its intended use. The grades range from a finger print remover to a heavy petrolatum that protects against corrosion for years under the most severe outdoor exposure.

Gain these benefits for your hydraulic operations

The big 400-ton hydraulic press shown above is used to stamp out parts for farm machinery in a big midwest plant.

When the press was first put into operation, plant operators followed the recommendation of a Standard Oil lubrication specialist and used STANOIL Industrial Oil in the hydraulic system. In over four years of continuous hard service, there has been no lost time because of inefficient performance of the hydraulic oil.

Oil capacity of the system is approximately 9 barrels; only 2 barrels make-up per year has been required. The oil in this system has never been changed. It has been centrifuged once to remove moisture which accumulated over three years' operation. Periodic tests of oil samples have shown that STANOIL has maintained its high lubricating quality. A recent analysis showed no increase in viscosity of the oil, no change in color, and a neutralization number of only 0.13 mg. KOH/gm.

You can rely on this unique many-purpose

STANOIL
TRADE MARK
Industrial Oil

oil to give you the same clean, dependable service in your plant's hydraulic systems, speed reducers, head stock gears, auxiliary turbines, compressors, and electric motors. You can rely, too, on the expert, on-the-spot service of a Standard Oil lubrication specialist. How you can obtain his help, quickly and easily, is explained at the right.

Standard Oil Company, 910 So. Michigan, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)

STANDARD

Cloudy and Earthy Flavors are Removed to Produce

The Taste of Sunshine—All the Time

ROYAL SOLUBLE SEASONINGS

ROYAL SOLUBLE SEASONINGS are truly distinctive—in flavor potency, purity and uniformity! Griffith has conquered the disturbing elements in nature! . . . eliminated the flavor variations in spices! And changed spice blending from an art to a science—with predictable, dependable results for spice users.

The secret to this new, high standard in flavor quality lies in Griffith's revolutionary extraction process.* It *removes* the disturbing strains in flavor . . . *captures and measures* the full potency of "true" flavors in spices.

Use ROYAL SOLUBLE SEASONINGS and improve your products with *the taste of sunshine, all the time.* Write today.

PEPPEROYAL and all ROYAL SOLUBLE SEASONINGS derived from Griffith's new extraction process.* Formulae tested for that "taste of sunshine" in Griffith's model production kitchen.

*(Patents Applied For)

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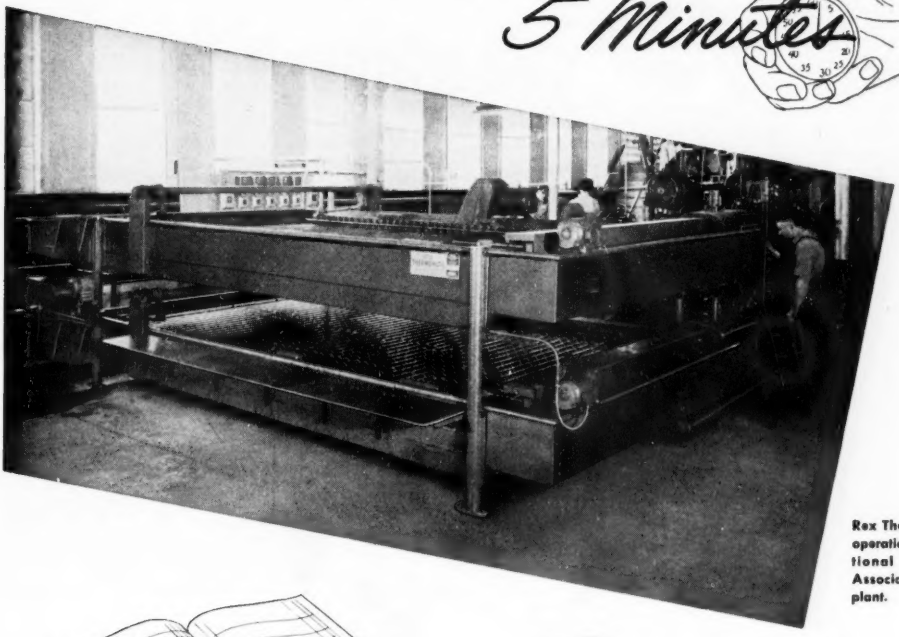
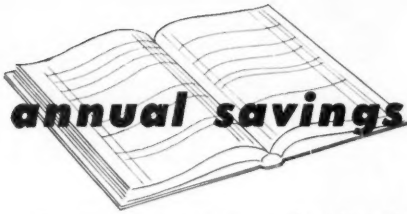
"cooling off period"... 5 Minutes



Rex Thermo-Roto in operation in a National Cranberry Association canning plant.



annual savings... Plenty!

From 72 hours to 5 minutes—that's the reduction in cooling time a cranberry packer is effecting by installing **Rex Thermo-Roto Coolers** in his canning lines. Before installation of the coolers, the hot canned sauce had to be taken off the line, set in boxes and left to cool from 24 to 72 hours, depending on the weather. Then the cans were taken from the boxes, put back in the line and moved on to labeling and crating.

Now the fast moving sauce line is uninterrupted in its trip from filling machines to the labelers. 410 cans of hot cranberry sauce enter and leave the cooler every minute. Detention time is only 5 minutes, and cans emerge 100° cooler and ready for immediate labeling.

Just look at the savings! The old method required nine men to handle the cooling operation: two men boxing, three men piling, three men unboxing and one on the conveyor. The **Rex Thermo-Roto** is turned on in the morning and off at the end of the day—that's the only manual operation required.

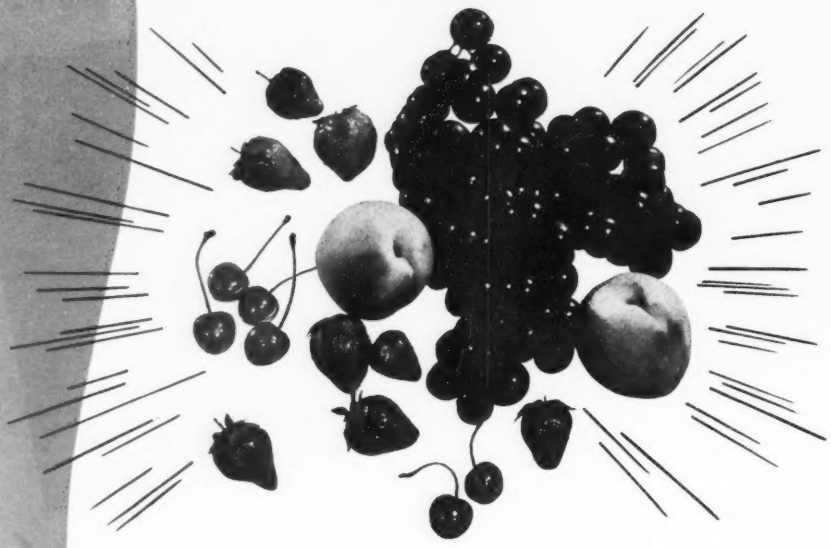
The cooling boxes cost 30 cents each, and 30,000 had to be on hand at all times. Furthermore, 5,000 new boxes were needed every year to replace broken ones.

The secret of this remarkably swift cooling of can contents is the rapid rotation of cans in a water bath which creates a turbulence in the can contents. The extremely rapid cooling cycle not only saves time, labor and plant space, but also checks the detrimental action of prolonged high temperatures and over-cooking. Product flavor, texture and color are preserved.

The **Rex Thermo-Roto** is used effectively for cooking or cooling most liquid or semi-liquid food products. Why not investigate the big savings it can make in your operations? Write to **CHAIN BELT COMPANY,** 1616 W. Bruce Street, Milwaukee 4, Wisconsin.

CHAIN BELT REX COMPANY ... FOOD PROCESSING EQUIPMENT

THERE IS SOMETHING NEW



IN TRUE FRUIT FLAVORS!

By adopting and improving on the new discoveries in fruit concentration WITHOUT THE USE OF FLAVOR KILLING HEAT, the ALVA laboratories now offer True Fruit flavors containing a considerably higher percentage of the fugitive volatile essences so vital to the fresh, true flavor of natural fruits.

Normally lost in distillation, these essences are initially captured and ultimately returned to the concentrate in the unusual equipment built by ALVA technicians. The result is a concentrate that is fresher, possesses more body and will go further in natural flavoring.

This remarkable technique is now standard in the production of ALVA True Fruits.

There's a difference . . . All the flavor is there . . . We'll send you samples for comparison.

Write for your copy of the complete ALVA Flavors Catalog

VAN AMERINGEN-HAEBLER, INC.
521 WEST 57th STREET, NEW YORK 19, N. Y.

Alva FLAVORS

TRADE PAPER EDITION
Published by
SCHUTTE and KOERTING
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ENGINEERING News

JET APPARATUS • HEAT TRANSFER EQUIPMENT • STRAINERS • CONDENSERS AND VACUUM PUMPS • OIL BURNING EQUIPMENT

The photo above shows the extent to which SK Rotameters are used in the plant of Publicker Industries, Inc., of Philadelphia, world's largest producers of industrial alcohol. All of the Rotameters shown on the panel are of the SK Universal type and are used to measure fluid flow rates in the manufacture of commercial alcohol. Numerous sizes are represented since capacity requirements vary considerably. *Bulletin 18-RA pictures and briefly describes the numerous types of Rotameters manufactured by SK and lists the technical bulletins available. If interested, send for a copy.*

SK Products List Offered

A new "Index of SK Equipment and Descriptive Bulletins" has just been issued by the company. This index lists products by application and alphabetically, together with the numbered descriptive bulletin pertaining to each product. Copies are available on request.

SCHUTTE and KOERTING Company
Manufacturing Engineers
28 CORNWELLS HEIGHTS
BUCKS COUNTY, PA.
Representatives in Principal Cities

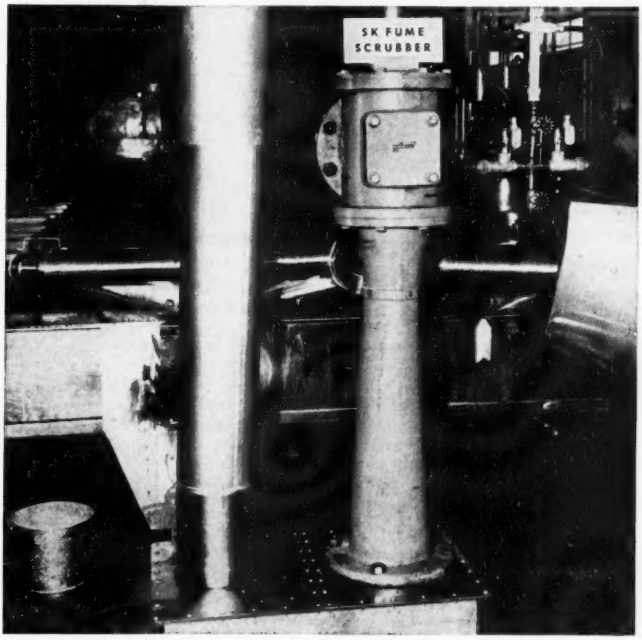
Frito Co. Purges Plant Fumes To Insure That Famous Flavor

Fritos, popular, taste-tempting corn chips of The Frito Company, are made under conditions as ideal as the company can make them to maintain and protect quality and flavor. Even the cooking vapors are collected and eliminated from the cooking tanks and plant. As a simple and efficient method of accomplishing this in various plants across the country, the company uses SK Fume Scrubbers, one of which is shown in the photo, with highly satisfactory results.

Since the cooking vats use oil at about 400° F., large amounts of steam and oil vapors are given off in cooking. These vapors are removed in the following manner:

Water, under pressure, enters the fume scrubber at the top through a spray nozzle designed to provide an angle of spray most suitable for maximum entrainment and scrubbing efficiency. The velocity of the water spray creates a draft in the chamber of the fume scrubber and causes the vapors to be drawn into the chamber where they are entrained, condensed, and absorbed by the water which is then discharged into a tank and removed from the plant. In this manner all odorous fumes are entrained by the scrubbing water, and vapors accompanying the fumes are condensed at the same time.

SK Fume Scrubbers, being simple in construction, efficient, and easy to keep clean, are particularly well suited for use in food processing plants. *For complete details on all types and sizes, request Bulletin 4-R.*



Gets fast, accurate feeding and blending control with G-E adjustable-speed drives

General Mills' G-E Thy-mo-trol* drives in new flour milling plant adjust flour flow to the capacities of succeeding equipment

For blending or adjusting flow at this plant, taper screw feeders, accurately governed by the speed of G-E Thy-mo-trol drive motors, take just the right amount of flour from overhead bins, feed it down to gather-up conveyors.

Regulating the flow of flour to the packer and the proportional blending of many different varieties of flour—to meet customers' specifications exactly—is an easy matter with General Electric Thy-mo-trol drives at the new Sperry Division flour-milling plant of General Mills at Vernon, California. Fourteen of these packaged adjustable-speed drives provide the close speed control and wide speed range needed to adjust the flow of material to succeeding machine capacities or to assure precisely the right mix every time in blending—without under-grading or over-grading of blends. Result: substantial savings in processing time and costs.

Thy-mo-trol—most accurate, most versatile, and fastest-acting of G-E's adjustable-speed drives—can provide literally thousands of speeds over a range as high as 100 to 1, holds set speed to within 0.5 per cent, if necessary, regardless of load changes. And it's only one of many G-E packaged adjustable-speed drives from which you can choose to meet your every food-processing need. Ask your G-E food industry representative to help apply the benefits of packaged adjustable speed to your plant. *General Electric Company, Schenectady 5, N. Y.*

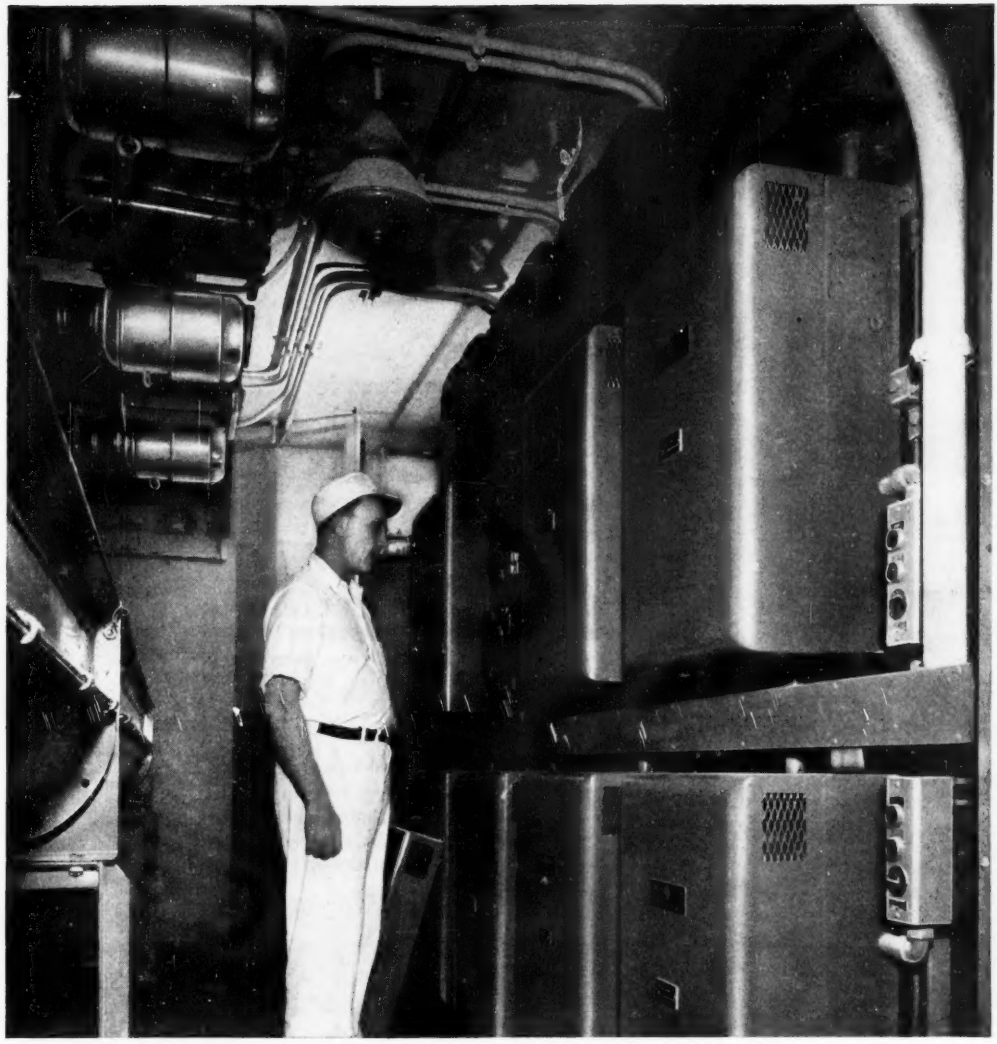
*Registered trade-mark of General Electric Co.

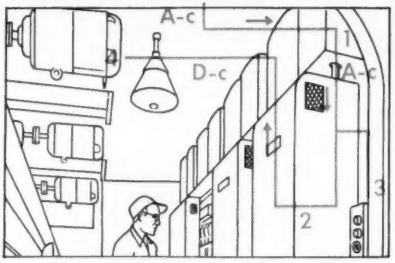
ADJUSTABLE-SPEED DRIVES

for food processing

USE THIS GUIDE TO THE RIGHT DRIVE!

Here's a comprehensive 26-page illustrated manual that tells all about adjustable-speed drives—their advantages, their operation, and how to select the right drive for *your* food processing needs. It's yours for the asking—Bulletin GEA-5334. Send, too, for Bulletin GEA-5337, describing Thy-mo-trol drives in full.





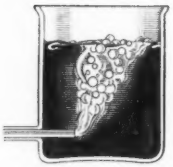
How Thy-mo-trol drive works. Diagram of a typical G-E Thy-mo-trol drive at the General Mills plant shows how a-c power is first brought to utilization voltage at a dry-type transformer (1) and then goes to the rectifier panel and "brain" (2). Here it is electronically converted to d-c and controlled from an operator's station (3) containing start and stop push buttons and speed-setting dial. D-c power is then delivered under precise electronic control to the d-c motors (4) driving the feeders (latter shown partially at left). Easy to install, operate, and maintain, Thy-mo-trol drives assure food plants the cost-cutting benefits of adjustable speed even under the most exacting conditions.

GENERAL ELECTRIC

652-9

OIL

GAS



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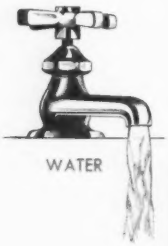
by low upkeep cost records in every type of service

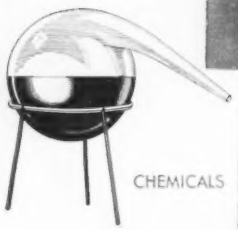
JENKINS BUILDS *EXTRA VALUE* INTO VALVES

— yet, despite this extra value, *you pay no more* for Jenkins Valves. For new installations . . . for all replacements, let the Jenkins Diamond be your guide to lasting valve economy. Jenkins Bros., 100 Park Ave., New York 17. Jenkins Bros., Ltd., Montreal.

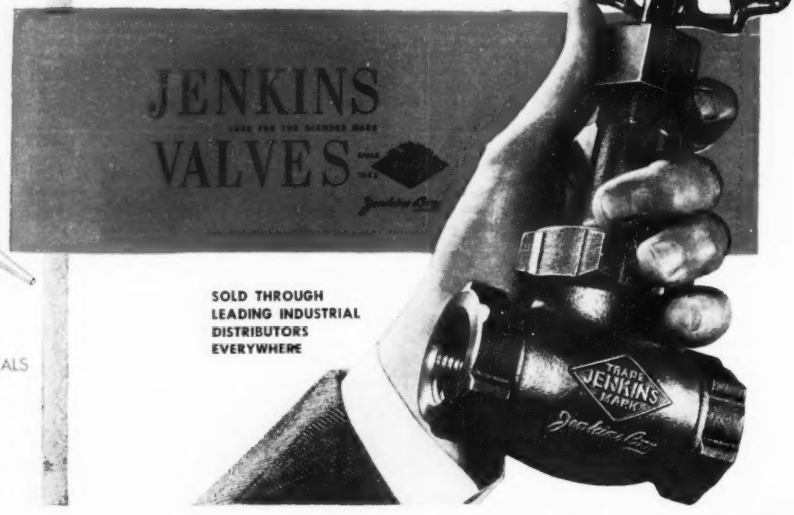
STEAM



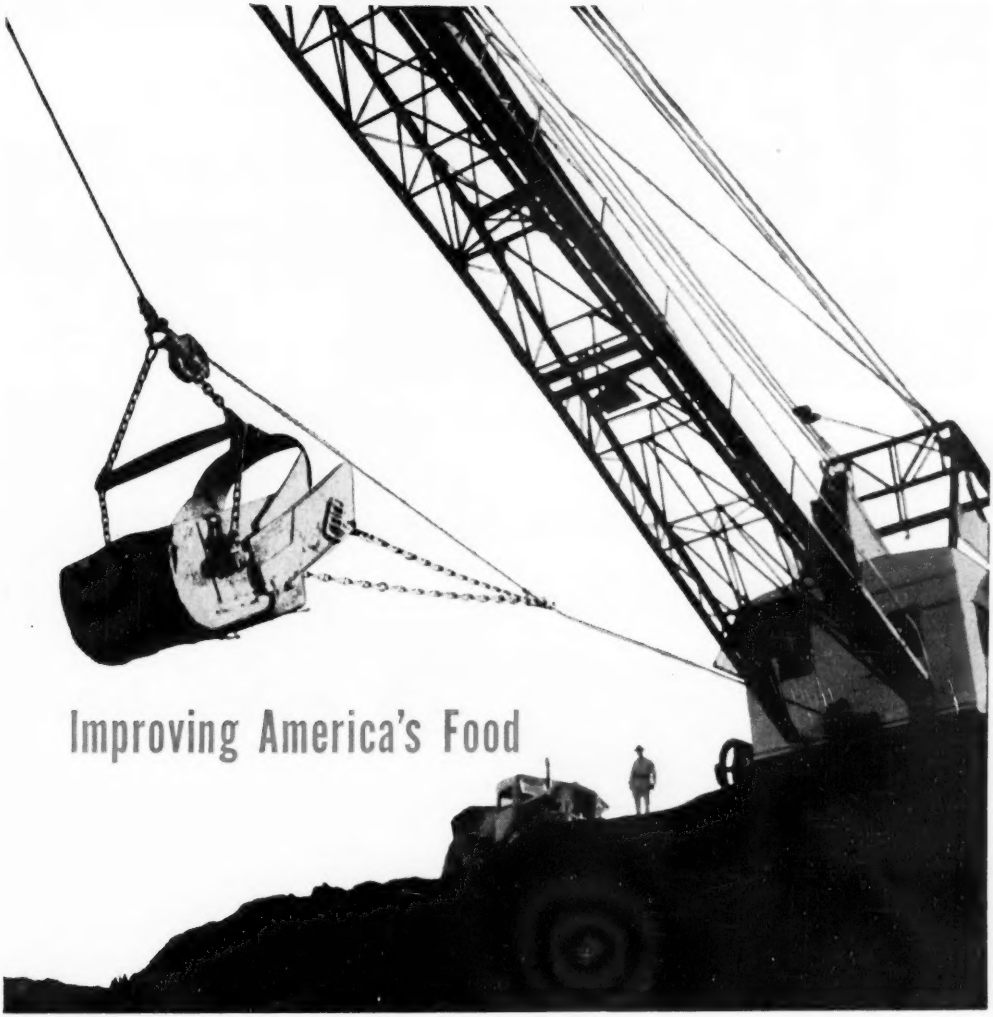
WATER



CHEMICALS



SOLD THROUGH LEADING INDUSTRIAL DISTRIBUTORS EVERYWHERE



A monstrous dragline scoop takes a ten-cubic-yard bite of reddish-brown earth . . . a bite that improves America's food.

The mechanical dinosaur is mining phosphate ore in Monsanto's ore beds in Tennessee. At a nearby electric furnace plant, Monsanto processes the ore to produce elemental phosphorus of better than 99.9% purity.

From this *pure* phosphorus, other Monsanto plants make phosphoric acid and phosphates for leavening and food fortification. Manufactured by modern methods, including strict laboratory control, these food-grade chemicals have the uniformity and superior quality synonymous with Monsanto.

Monsanto Research strives constantly to improve chemicals for the food industry, and, in the Monsanto Food Technology Laboratory, to find better ways to use them. MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 South Second Street, St. Louis 4, Missouri.

Monsanto Chemicals for the Food Industry

Phosphoric Acid—75% food grade and 85% N.F.

Phosphate Leavening Agents—Sodium acid pyrophosphate, MD grade. Sodium acid pyrophosphate. Calcium phosphate, mono.

Calcium Supplements—Calcium phosphate, di, dihydrate. Calcium phosphate, di, anhydrous. Calcium phosphate, tri. Calcium pyrophosphate (normal).

Iron Supplements—Sodium ferric pyrophosphate. Ferric orthophosphate.

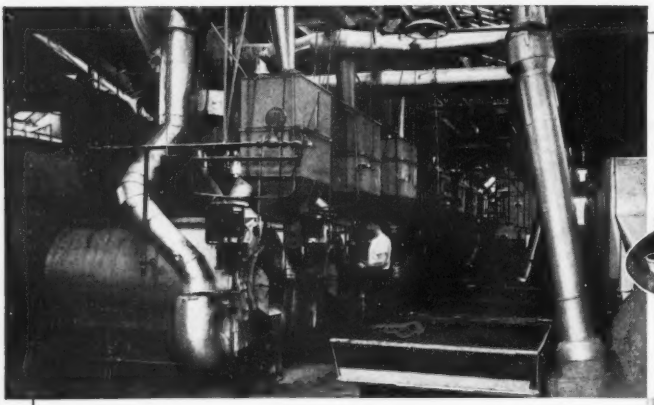
Nutrient Salts—Ammonium phosphate, di. Ammonium phosphate, mono.

Emulsifiers for Food Processing—Sodium phosphate, di. Sodium pyrophosphate, tetra.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

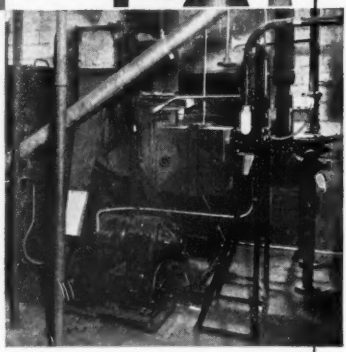
MONSANTO
CHEMICALS — PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND



Battery of 9 batch Gas-fired coffee roasters. Gas burners fire vertically in combustion chamber, visible at extreme left.

Woolson official "cup tests" various coffee brands.



Gas burner equipment and controls at charging end of new Jabez Burns continuous roaster.

For Uniform Coffee Roasting

Woolson Spice Company

relies on GAS exclusively

FAST, UNIFORM ROASTING is essential to private brand coffees processing and packaging at Woolson Spice Company. This Toledo, Ohio, food manufacturer uses GAS in processing more than 10 tons of coffee per hour, and has been coffee-roasting with GAS exclusively for more than 25 years.

The original Jabez Burns coffee roasters employed a direct Gas-firing principle. These units were later modernized with Gas-fired air heaters with automatic controls, and the capacity of each roaster was increased 50%. The battery of 9 roasters has an output capacity of 25,000,000 pounds annually.

Increasing national per capita demand, now almost 19 pounds per year, recently required another expansion at Woolson Spice Company. Accordingly, a modern Gas-fired Jabez Burns continuous convection roaster was installed, bringing total annual production to 33,000,000 pounds.

For coffee roasting, or any other type of food processing, GAS has many advantages over other available fuels. The Woolson management expresses it this way: **"GAS is the only fuel which will roast our product economically, uniformly, and at the same time bring to each of our many blends the ultimate in consumer satisfaction."**

Your Gas Company Representative will help you take advantage of the modern methods of heat processing with GAS.

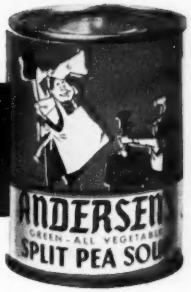
AMERICAN GAS ASSOCIATION

420 LEXINGTON AVE., NEW YORK 17, N.Y.

MORE AND MORE... THE TREND IS TO GAS FOR ALL HEAT PROCESSING OF FOODS

A WHOLE NEW CONCEPT OF INSTRUMENTATION BASED ON BROWN CONTROL TECHNOLOGY IS REVOLUTIONIZING THE FOOD INDUSTRY FROM COAST TO COAST!

aseptic canning of famous flavor



...controlled by TRIPLE-SAFE SYSTEM!

This master control panel automatically regulates Martin Aseptic Canning Process. Vital temperatures throughout system are recorded on multipoint instrument (right).

ANDERSEN'S Green Split Pea Soup has long been a favorite on the West Coast. But attempts to can it by conventional processes have consistently failed. Now, with the Brown Triple-Safe Control System protecting the Martin Aseptic Canning Process, the soup is being successfully canned . . . retaining all of its kitchen-fresh qualities.

Here's how it's done. Non-indicating controllers operate signal lights to show when the process is operating at proper temperature. An *ElectroniK* potentiometer automatically controls the product sterilization temperature within close limits, shuts down the process if the soup is not sterilized. And, an *ElectroniK* Strip Chart Recorder continuously records vital temperatures at eight points throughout the system.

This is another example of what can be done by *creative instrumentation* for a progressive industry, utilizing the resources of the world's largest organization for industrial process control. For detailed information on instrumentation for Aseptic Canning, write for a copy of Data Sheet No. 3.2-15. Call in our local engineering representative for a discussion of *creative instrumentation* for any food process . . . he is as near as your phone. MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4502 Wayne Ave., Philadelphia 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.

MINNEAPOLIS Honeywell

BROWN INSTRUMENTS

NEW HOME OF
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SERVING
Sterwin Chemicals INC.

SEE US AT
BOOTH 48
Institute of Food Technologists Meeting
NEW YORKER HOTEL
JUNE 17-20

Sterling-Winthrop Research Institute

RENSSELAER, N. Y.

Located next to the giant Winthrop-Stearns plant at Rensselaer, N. Y., is the beautiful new home of the Sterling-Winthrop Research Institute. This impressive structure is among the largest and most modern laboratories of its kind in the country.

STERWIN PRODUCTS RESEARCH

A large staff of scientists, using the most modern scientific equipment and methods, is continually striving, as a part of the Institute's broad research program, to improve existing Sterwin products and to develop new products and methods to aid the food industry in the production of better, more nutritious foods.

Here are some of the outstanding products developed by the research facilities behind Sterwin Chemicals:

B-E-T-S —the *original* Bread-Enrichment Tablets, containing vitamins and Ferrous Sulfate, the highly assimilable form of Iron as an exclusive feature.

VEXTRAM —the *original*, stable mixture containing vitamins and food iron for the enrichment of flour and other cereal products.

OXYLITE —a highly efficient and economical flour bleaching agent.

KUROLITE —a simple, effective and non-toxic flour maturing agent.

ROCCAL —the *original* quaternary ammonium germicide for better food plant sanitation.

ZIMCO —brand of Lignin Vanillin U. S. P. A finer Vanillin of utmost purity and exquisite aroma.

PARAKEET brand of Certified Food Colors.

For information, consult your Sterwin Technically Trained Representative, or write to Sterwin Chemicals Inc., 1450 Broadway, New York 18, N. Y.

Sterwin Chemicals INC.
Subsidiary of Sterling Drug Inc.
1450 BROADWAY, NEW YORK 18, N. Y.

Distributor of the products formerly sold by Special Markets-Industrial Division of Winthrop-Stearns Inc., and Vanillin Division of General Drug Co.

JUST THE THING

TO MAKE A

SALAD SING!

Battery of Pneumatic labelers in operation at plant in Bayonne, N. J. One of several locations where Pneumatic labeling and capping equipment has been installed for The BEST FOODS, Inc.

another popularity winner bottled by PNEUMATIC

No doubt about it — The BEST FOODS people know how to make a mayonnaise to tempt the popular taste. HELLMANN'S is their name for it, as millions of women will tell you.

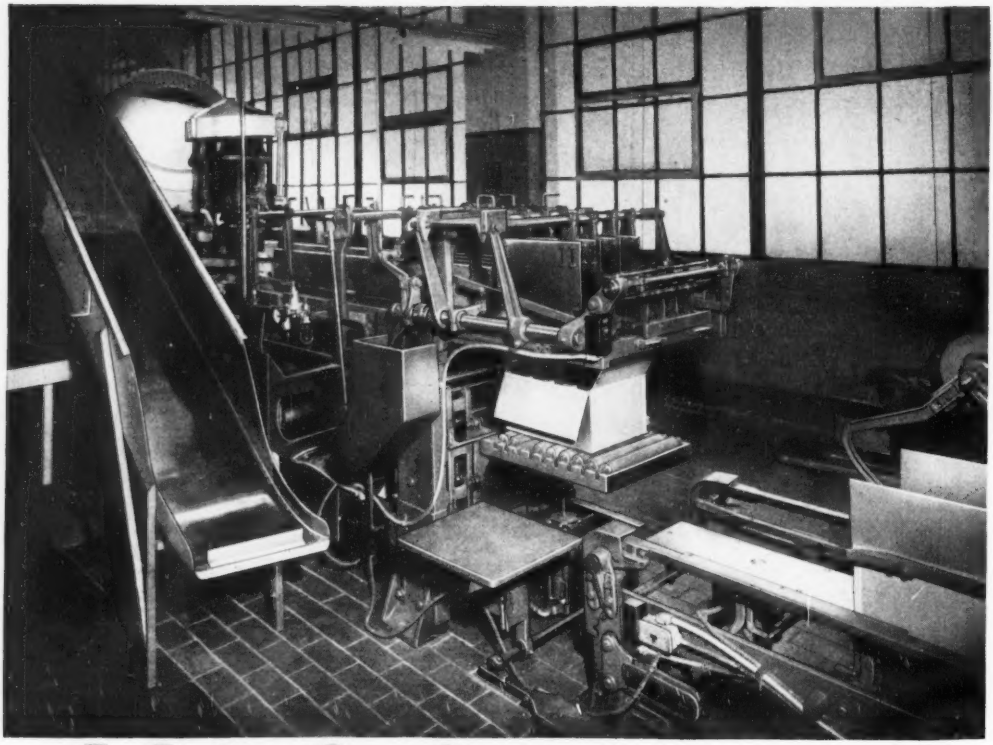
The BEST FOODS, Inc., know more than a little about the best methods of bottling their famed product, too. From long, first hand experience they've learned you can do a neater, smoother job of capping and labeling, at a "lower cost per container", by using Pneumatic equipment.

There are so many, many other concerns of similar character and high standing who share the same opinion about Pneumatic machines that it is important for you to know just why they feel that way. We'll be glad to fill in the details for you.

PNEUMATIC SCALE CORP., LTD., 91 Newport Avenue, Quincy 71, Mass.
Also: New York; Chicago; San Francisco; Los Angeles; Seattle; Leeds, England.

PNEUMATIC
LOWER COST PER CONTAINER

PACKAGING AND BOTTLING MACHINERY



For Packing Glass Containers

Standard-Knapp equipment is high speed, precise and economical. Containers are under complete control throughout the operation. Load forming is automatically regulated to assure a full pack for every case. Damage to containers or cases is eliminated.

Standard-Knapp Bottle Packers are more than equal to the challenge of higher production at lower costs. That is why they are the first choice with leading manufacturers and processors of food, beer, carbonated beverages, and chemicals.

Only the best is

OTHER EMHART PRODUCTS INCLUDE:

PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES

PLAX CORPORATION

Subsidiary of Emhart Mfg. Co.

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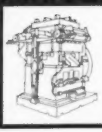
PREMIUM QUALITY STAMPING PRESSES

THE V & O PRESS CO.

Division of Emhart Mfg. Co.

HUDSON, NEW YORK



HIGH SPEED AUTOMATIC PRESSES

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GLASS MAKING MACHINES

HARTFORD-EMPIRE CO.

Division of Emhart Mfg. Co.

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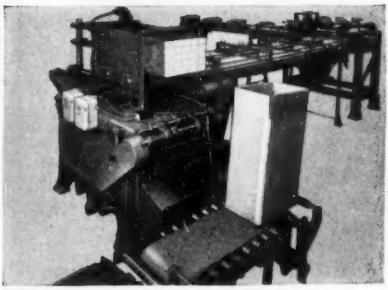
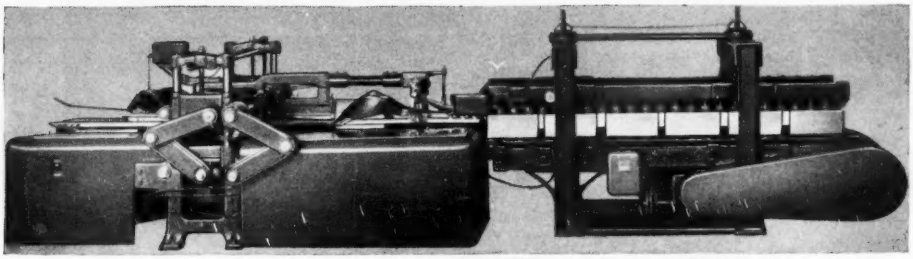
In the field of automatic packaging equipment



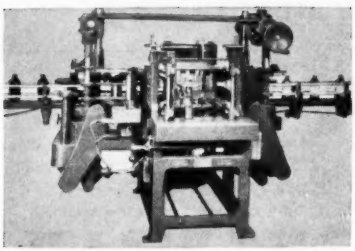
For Packing Cartons

into cases, Standard-Knapp equipment is preferred for its high speed, safe handling and adaptability to varying load patterns. Standard-Knapp Carton Packers are used by foremost manufacturers of soaps, chemicals, cigarettes, pharmaceuticals and cosmetics.



For Glueing and Sealing

shipping cases, Standard-Knapp machines have set the standard of performance for years. If you have heard of gluers and sealers, you have heard of Standard-Knapp.



For Automatic Labeling

of glass and tin containers, it's Standard-Knapp equipment for neat, clean and tight label application. In the food field, where high quality labeling is a must, Standard-Knapp Labelers are preferred.

good enough

STANDARD-KNAPP

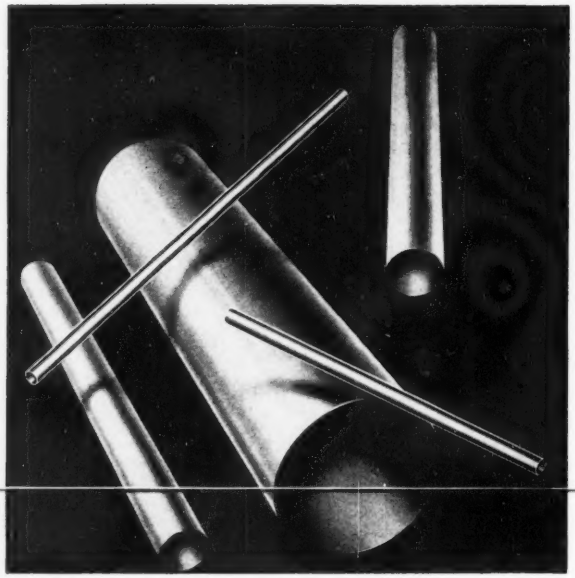
DIVISION OF
EMHART MFG. CO.

PORTLAND, CONNECTICUT

FACT-PACKED CATALOGS

Want to review Standard-Knapp automatic packaging machines in detail? Our catalogs will give you some eye-opening facts.

Please write Dept. F, Standard-Knapp, Portland, Connecticut.



where stainless steel tubing

is required—

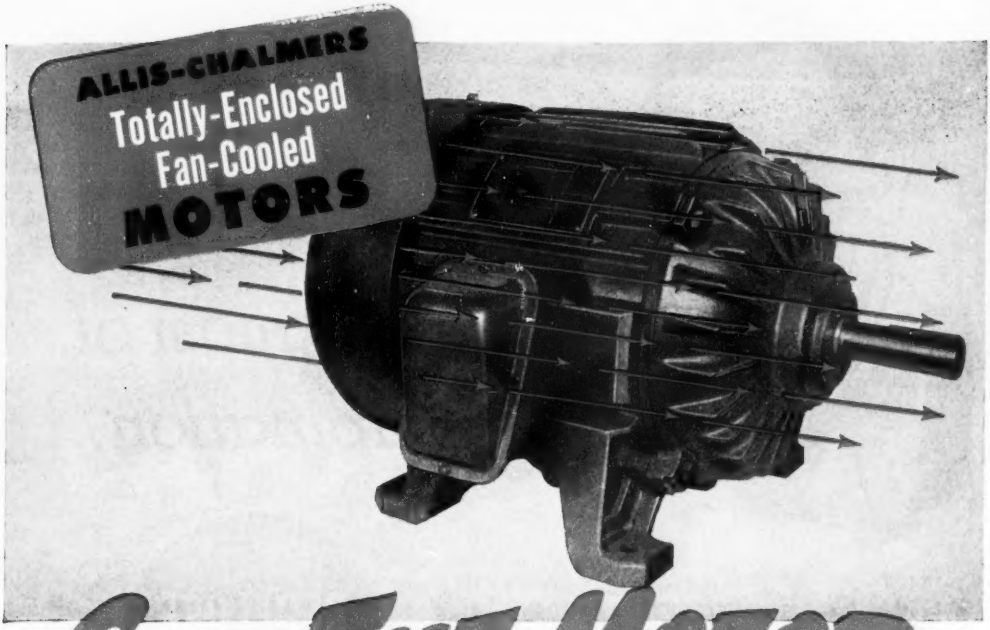
TRY TRENTWELD

Stock lines in food, paper, and chemical plants; heat exchanger units in processing industries; cooling coils in breweries, beverage industry, dairies and dairy equipment . . . throughout all industry, wherever there's a stainless or high alloy tubing application, there you'll find TRENTWELD.

And it's to be expected! TRENTWELD is made in a *tube* mill by *tube* engineers who roll and weld stainless and high alloy tubing *exclusively.* Then too, TRENTWELD is available in a full range of sizes—⅛" to 36" in diameter. This coupled with Trent's convenient mid-continent location means prompt delivery of what you want . . . when you want it. If yours is a stainless or high alloy tubing requirement: Call on us. TRENT TUBE COMPANY, *Subsidiary of Crucible Steel Company of America.* General offices and plant: East Troy, Wisconsin; Sales offices in principal cities.

TRENTWELD

STAINLESS STEEL TUBING



GET THE MOTOR that Cleans Itself

DROP MOTOR MAINTENANCE COSTS to a new low by reducing motor cleaning operations. And this new Allis-Chalmers Type APZ tefc motor makes maintenance costs lower than ever before on this type of motor.

Here's Why

Concealed air passages and pockets have been eliminated; dirt cannot build up to cause overheating. Cooling air is blown over the ribbed cast iron frame and bearing housings carrying dirt away with it. How about oily dirt that sticks? It can be wiped or blown off without stopping the motor.

Rigid Construction

The frame is of rigid cast iron which not only has high inherent corrosion resistance, but also holds bearings in alignment. Bearings are prelubricated at the factory and should need no attention for years. Tapped holes with pipe plugs to permit regreasing and to provide grease relief are standard equipment.

Get All The Facts

The new Allis-Chalmers Type APZ totally-enclosed fan-cooled chemical motor is built in all NEMA standard frame sizes from 224* to 505. Also in explosion-proof type.

Your A-C Authorized Dealer or District Office has complete information. Call today, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B6144.

A-3397

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Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

Texrope and Vari-Pitch are Allis-Chalmers trademarks.

ALLIS-CHALMERS

*Similar design non-ventilated motors Type APK, also available in frames 203 to 224 inclusive.

Make the most of this combination....

1. *Continuing basic research . . .* in corn products chemistry, directed by the foremost research men in the industry.

2. *Technical and engineering services . . .* to help you apply new methods and new products to your production setup. No obligation for on-the-spot studies. (Write our Technical Sales Department.)

3. *Fine products of uniform quality . . .* from a dependable, large volume source of supply.

● Globe, Cerelose, Puritose, Buffalo and Hudson River are registered trade-marks of Corn Products Refining Company, New York, N. Y.

CERELOSE BRAND dextrose

PURITOSE BRAND CORN SYRUP

GLOBE BRAND CORN SYRUP

CORN PRODUCTS REFINING COMPANY, 17 BATTERY PLACE, NEW YORK 4, N. Y.

Save Running Time

Speed is essential if trucks are to make deliveries on time. But speed alone won't do the job. Power is also necessary to prevent delays in getting away under full loads, climbing grades, pulling out of tough spots.

Eaton 2-Speed Axles provide drivers with both *speed and power*. This is made possible by the two gear ratios which Eaton provides for every conventional one. From "low low" to "high high" the Eaton driver can quickly find the most efficient gear ratio to deliver pulling power when needed, speed when desired. The result is faster running time.

And, exclusive Eaton features assure longer axle life. Your truck dealer will gladly explain Eaton's planetary gearing, positive lubrication, and other outstanding features.

EATON
2-Speed Truck
AXLES

Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

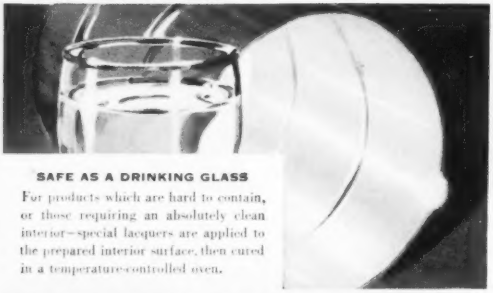
PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

WORLD'S FIRST COMPLETELY LITHOGRAPHED AND INNER ROLLER-COATED 55-GALLON STEEL DRUM

Rheem R

BIG CONTAINERS NOW "TRAVELING BILLBOARDS"

Consider the merchandising opportunities this remarkable new package presents! The durable and lustrous finish of Rheemcote drums, lithographed with *your* distinctive colors, trademarks and designs, will billboard your product and name before the eyes of the world.

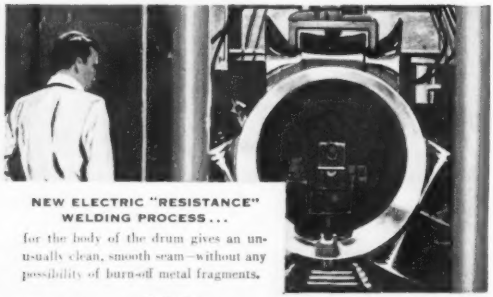


SAFE AS A DRINKING GLASS

For products which are hard to contain, or those requiring an absolutely clean interior—special lacquers are applied to the prepared interior surface, then cured in a temperature-controlled oven.

ROLLER-COATING OPERATION...

applies the base coat to the steel surface, assuring positive adhesion for utmost resistance against weather and handling.



NEW ELECTRIC "RESISTANCE" WELDING PROCESS...

for the body of the drum gives an unusually clean, smooth seam—without any possibility of burn-off metal fragments.

After many years of research, the Rheem Manufacturing Company, world's largest maker of steel shipping containers, is proud to have developed the Rheemcote Process in this, its 25th year of service to industry.

For a *free*, descriptive, beautifully illustrated brochure on this important contribution to marketing—write or wire Rheem today.

Rheem R

RHEEM MANUFACTURING COMPANY
570 Lexington Avenue, New York 22, N. Y.
Plants and Affiliates Throughout The World

Rely on Rheem to Deliver Your Goods..and Goodwill

Some things give solid satisfaction

There's nothing like it—that well-deserved snooze after a good go at the lawn. Nothing either, like the feeling that comes when you know you've given your product the best, all along the way.

This means, of course, that you've used sugar. It is always uniform, has more sweetening power, and brings out the best flavors of higher-priced ingredients. You know that its use will heighten the quality of your product.

For your own gratification —and your customers'!— use sugar. It pays off in solid satisfaction!

SUGAR
INFORMATION INC.
NEW YORK 5 NEW YORK

IT'S GOT TO BE *Continuous!*

The Steady Flight of the Helicopter

So must processing be continuous to be truly economical and fast. De Laval centrifugal machines make separation or clarification as continuous as any other phase of your process. They do in minutes or even in seconds work that once took hours by settling or other slow means.

Problems of separation or clarification are not all alike. Many factors—specific gravity and viscosity of the liquids, the quantity of solids present in one or both liquids, the kind of solids—influence the choice of the type of centrifugal machine. De Laval has a complete line of machines, each designed to do a particular job to best advantage. You can be sure with De Laval equipment that separation or clarification is most complete.

Your problem may be quite similar to one that has already been solved by De Laval machines. It will pay you to ask.

THE DE LAVAL SEPARATOR COMPANY
165 Broadway, New York 6 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 5
THE DE LAVAL COMPANY, Limited, Peterborough, Ont.

IT'S *De Laval* FOR

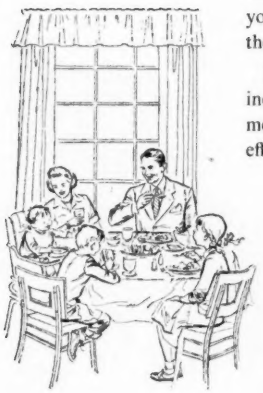
the First Name in Centrifugals
the First Thought for CONTINUOUS
SEPARATION · CLARIFICATION · CONCENTRATION

What 50 productive years have meant to the food industry

This year, we at American Can Company are observing our 50th anniversary.

Offhand, you wouldn't think our anniversary would be very important except to the 33,000 people who work for Canco. But may we remind you that this anniversary celebrates 50 productive years that have helped the food industry grow and prosper?

During this half century, Canco's growth and co-operation with your industry have brought forth widespread process and product improvement—opening *new* markets and helping you sell in *all* markets more efficiently than ever before.



A good case in point is the sanitary can—most famous of all metal containers. This Canco development made possible large volume canning of fruits and vegetables—revolutionized the grocery business—changed America's eating habits.

The people of Canco are proud of this and the many other Canco contributions to this industry.

And it is our pledge for the years ahead that the inventiveness and ingenuity so characteristic of Canco will continue to explore and open up new areas of usefulness to your industry and the consumers it serves.

1901—50TH ANNIVERSARY—1951

CANCO

AMERICAN CAN CO.

New York • Chicago • San Francisco • Hamilton, Canada

(Advertisement)

With This NEW Improvement Niagara "No-Frost Method" puts you a big step ahead in trouble-free, automatic refrigeration or freezing

Niagara "No-Frost Method" keeps frost and ice COMPLETELY OUT of your cooling, chilling, freezing or cold storage.

It uses Niagara No Frost Liquid Spray to keep frost and ice from ever forming. It gives you, automatically, refrigeration with no defrosting, and full capacity NEVER cut down by ice building up progressively on refrigeration coils.

Now, a NEW design No Frost Liquid concentrator, using a new principle, takes away moisture as fast as it is condensed by evaporating it at low temperature — not boiling it away at high temperature. It has 14 times the capacity of the old method per dollar of investment — one concentrator will handle a battery of high capacity spray coolers.

This gives you more refrigeration at lower cost; less machinery in less space. You operate at high suction pressure, saving power and wear and tear on compressors.

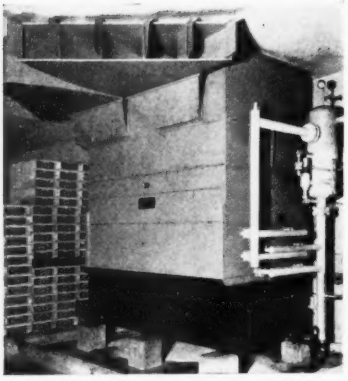
The extra capacity and lower cost both for equipment and operating makes this method advantageous for every type of refrigeration use — both for freezing and for moderate temperatures — for large "live" loads as in meat chilling or in fruit and vegetable pre-cooling — for rooms that are filled and emptied of product daily, such as milk rooms and terminal storage warehouses.

You get true trouble-free refrigeration . . . No brine . . . no salt solution . . . no dirt . . . no mess . . . It is entirely clean; you get rid of dirt and odors. You reduce both equipment and operating costs.

With Niagara "No-Frost Method" you easily keep constant temperature of products in your rooms, improve quality, get more production.

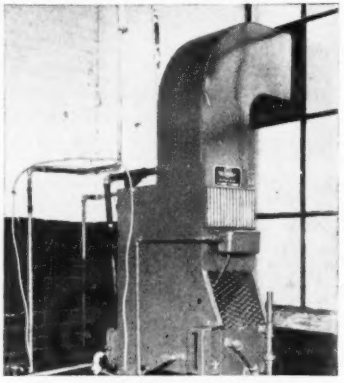
There are two series of concentrators: one, with evaporating capacity up to 6 gal. of water per hour, is economical for small freezing or hardening rooms, milk rooms, single room storage. The other, evaporating up to 36 gal. per hour, serves a battery of large coolers as in multiple floor cold storages, large chilling, freezing or pre-cooling plants.

For complete information write to the Niagara Blower Company, Dept. FI, 405 Lexington Avenue, New York 17, New York.



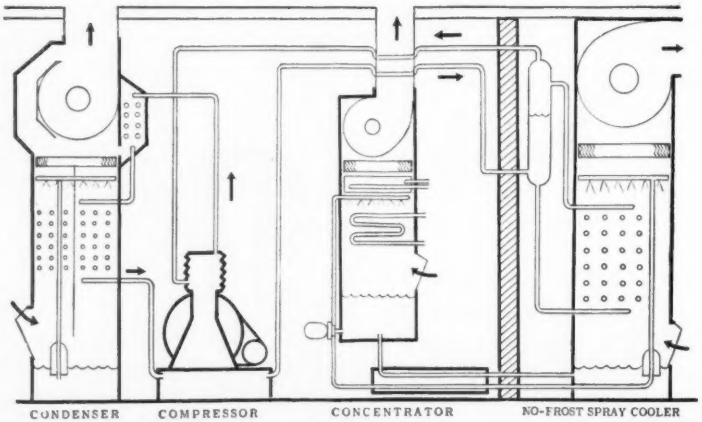
Niagara No Frost Spray Coolers
PATENTED

With the "No-Frost Method" you always get the full amount of refrigeration your compressor will deliver and for which you are now paying. If you need extra capacity, the Niagara "No-Frost Method" can help you get it with your present compressor.



Niagara No Frost Concentrator
PATENTED

No salt solution . . . No brine . . . The Niagara "No-Frost Method" gives you a clean system, clean rooms, clean equipment.



DRY, STABILIZED, CRYSTALLINE VITAMIN A ACETATE*

ANOTHER SIGNIFICANT PFIZER DEVELOPMENT

opens profitable new opportunities for fortifying food products

● For the first time in history Crystalline Vitamin A is now available in commercial quantities to manufacturers of food products in both DRY-STABILIZED and LIQUID forms that are particularly well adapted to a wide range of applications in the food and beverage fields.

DRY, STABILIZED, CRYSTALLINE VITAMIN A ACETATE

DRY.....free-flowing granules in three mesh sizes . . . can be handled and stored under all normal conditions. Packed in standard amber glass, screw top bottles and in drums.

STABLE.....insensitive to oxidation, permitting longer storage time, reduces overages.

PURE.....contains only Crystalline Vitamin A Acetate, sugar and gelatin, assuring higher quality products, greater consumer acceptance.

PALATABLE.....practically odorless and tasteless.

UNIFORM.....high uniform potency, standardized at 500,000 U.S.P. units per gram.

COMPATIBLE....coated crystals are isolated from other ingredients, permitting intimate mixtures with other vitamins and minerals.

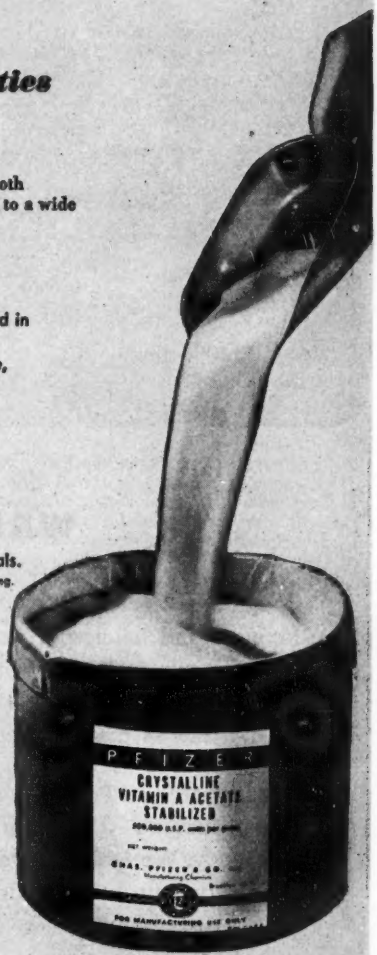
*U. S. Patent Nos. 2183053, 2218592, 2183084, 2299929, 2218591 and other patents pending.

VITAMIN A PALMITATE

A light yellow liquid of excellent uniformity derived from Crystalline Vitamin A Acetate. Not less than 90% pure. Free from oily diluents and impurities of undetermined nature. Practically odorless and tasteless. Potency not less than 1,650,000 U.S.P. units per gram.

Also available in Corn Oil Solution with a standard potency of 1,000,000 U.S.P. units per gram.

Packed in standard aluminum containers filled under nitrogen.



PFIZER QUALITY

PFIZER

Pioneers and Leading Manufacturers of Vitamins

CHAS. PFIZER & CO., INC., 630 FLUSHING AVE., BROOKLYN 6, N. Y.; 425 NORTH MICHIGAN AVE., CHICAGO 11, ILL.; 605 THIRD ST., SAN FRANCISCO 7, CALIF.

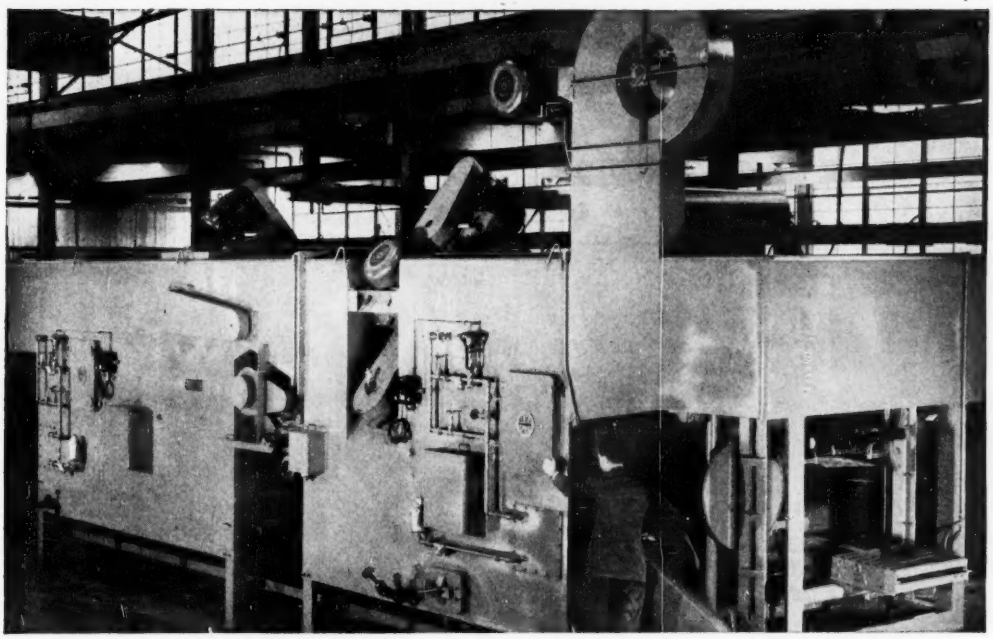
"WASH DAY"—AN ORIGINAL LITHOGRAPH BY HENRY E. WINZENREID

WASH DAY BLUES

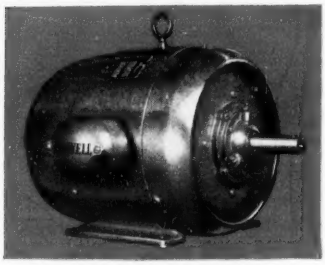
Soap . . . protector of health and beauty . . . needs protection itself. Today's laundry and toilet soaps contain delicate aromas that must be preserved . . . and oils that must not discolor the outer wraps. Many others require sift-proof packages. That's why so many soaps and soap products rely on special Riegel papers for positive protection.

There's a Riegel Paper for almost any requirement you may have in protective packaging . . . a paper you can depend on for economy and production efficiency. We feel sure we can serve you in the same effective manner we now serve the sales leaders in so many different fields. Write us today.
Riegel Paper Corporation • 342 Madison Avenue, New York 17, N. Y.

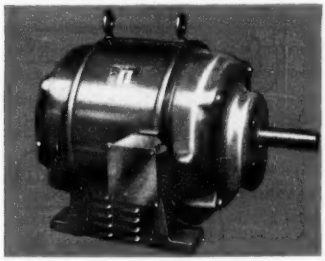
Riegel **TAILOR-MADE PAPERS FOR PROTECTIVE PACKAGING**



How to give a cylinder block a clean start



Howell Type K Motor. Offers constant performance in the presence of dirt, dust, fumes and moisture. Sizes 3 to 150 H.P. at 1800 R.P.M. Either vertical or horizontal mounting.



Howell Type F Motor. A high-slip, high-torque motor designed for punching and shearing operations. Sizes $\frac{1}{3}$ to 200 H.P. in open frames; $\frac{1}{2}$ to 125 H.P. in enclosed frames.

This new Centri-Spray washer thoroughly cleans up to 400 cylinder blocks an hour. It often runs 3 shifts a day, six days a week. A tough job for the nine Howell Industrial Motors which power it!

Four 25-H.P. motors operate the unique Centri-Spray units which envelop the rotating blocks with a powerful high-volume spray of water. A high-head centrifugal pump, equipped with a 15-H.P. motor, flushes blocks internally. All foreign matter is *completely removed*, inside and out. Four motors, from 1/3 to 20 H.P., power the automatic sludge remover, the recirculating pump, the main conveyor and the high-pressure blowoff fan.

Howell engineers worked closely with this manufacturer to provide the *right* motor for each application. As a result, this Howell-powered washer easily takes the hardest operating schedule in stride.

Highest quality motors, designed for your specific jobs, are typical of the service you get from Howell. Let us handle your electric motor needs. You'll find precision-built Howell industrial type motors a profitable investment that pays off in extra years of dependable performance.

HOWELL ELECTRIC MOTORS COMPANY

Howell, Michigan

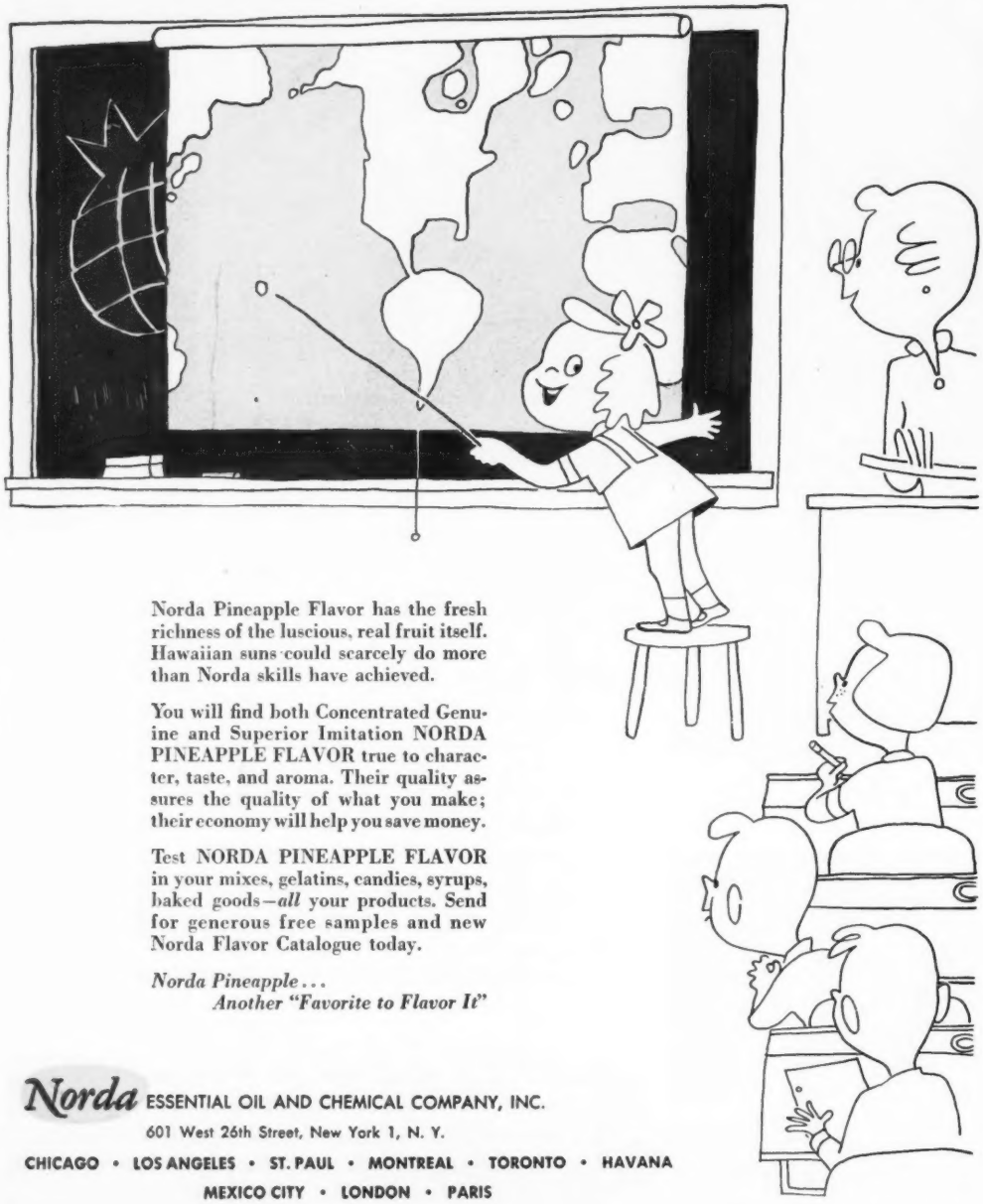
HOWELL Red Band MOTORS

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Precision-built industrial motors since 1915

"... but nowadays, my mother says,
You don't go so far any more,
Because she says **NORDA PINEAPPLE FLAVORS** so many good things in her store."



Norda Pineapple Flavor has the fresh richness of the luscious, real fruit itself. Hawaiian suns could scarcely do more than Norda skills have achieved.

You will find both Concentrated Genuine and Superior Imitation NORDA PINEAPPLE FLAVOR true to character, taste, and aroma. Their quality assures the quality of what you make; their economy will help you save money.

Test NORDA PINEAPPLE FLAVOR in your mixes, gelatins, candies, syrups, baked goods—*all* your products. Send for generous free samples and new Norda Flavor Catalogue today.

Norda Pineapple...
Another "Favorite to Flavor It"

Norda ESSENTIAL OIL AND CHEMICAL COMPANY, INC.
601 West 26th Street, New York 1, N. Y.
CHICAGO • LOS ANGELES • ST. PAUL • MONTREAL • TORONTO • HAVANA
MEXICO CITY • LONDON • PARIS

It's the Nash!

The ability of Nash Compressors to maintain original performance over long periods is no accident. Nash Compressors have but a single moving element, the Nash Rotor. This rotor is precision balanced for long bearing life, and it revolves in the pump casing without metallic contact. Internal lubrication, frequent cause of gas contamination, is not employed in a Nash. Yet, these simple pumps maintain 75 lbs. pressure in a single stage, and afford capacities to 6 million cu. ft. per day in a single compact structure.

Nash Compressors have no valves, gears, pistons, sliding vanes or other enemies of long life. Compression is secured by an entirely different principle of operation, which offers important advantages often the answer to gas handling problems difficult with ordinary equipment.

Nash Compressors are compact and save space. They run without vibration, and compression is without pulsation. Because there are no internal wearing parts, maintenance is low. Service is assured by a nation-wide network of Engineering Service offices. Write for bulletins now.

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature Automatically maintained.

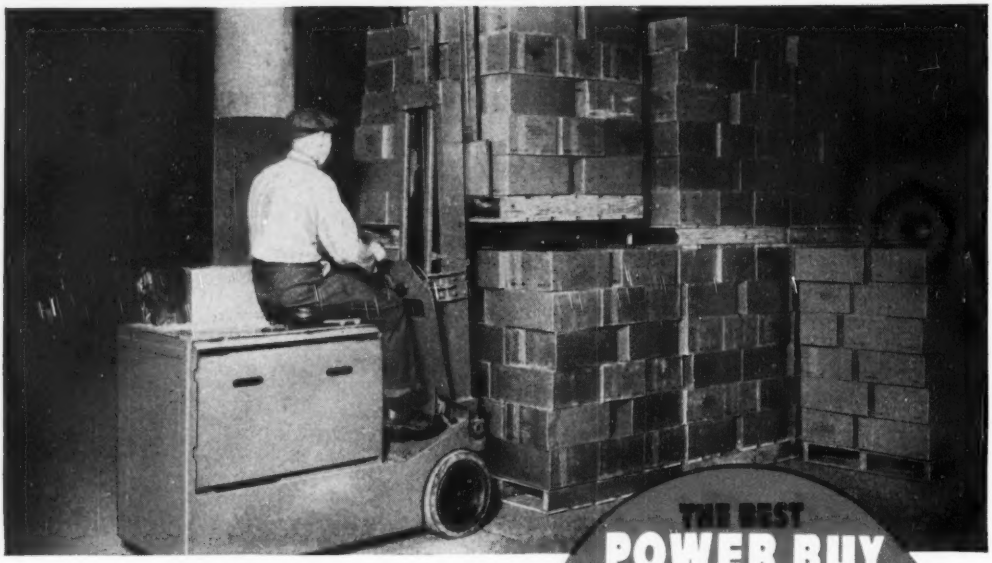
Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

NASH ENGINEERING COMPANY

284 WILSON, SO. NORWALK, CONN.

INTO THE STRETCH WITH SPEED TO SPARE



No letdown during the shift, no slowdown at the end! That calls for *dependable* power, *long-lasting* power. You get both when your battery-electric trucks are Exide-Ironclad equipped. You get steady, uniform speed throughout each shift, with as much tonnage moving in the final hour as in the first. Exide-Ironclad Batteries also give you:

INSTANT SURGE OF POWER, plus finger-tip control, split-second handling, easy maneuvering, accurate spotting.

ROUND-THE-CLOCK PERFORMANCE—no mechanical troubles, no unscheduled down time.

LOW OPERATING COSTS—on the average of 4 cents an hour for power . . . batteries absorb a very high percentage of charging current.

LOW MAINTENANCE COSTS—seldom more than 15 cents per shift.

EXCEPTIONALLY LONG LIFE — proved on more than 100,000 heavy-duty jobs.

INHERENT SAFETY — freedom from the hazards of fire, fumes, noise and uncleanliness.

There are Exide-Ironclad Batteries for every size and make of battery-electric truck.

Write for more facts and FREE copy of the new Exide-Ironclad Battery Motive-Power Catalog, Form 5161.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2

Exide Batteries of Canada, Limited, Toronto

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

1888 . . . DEPENDABLE BATTERIES FOR 63 YEARS . . . 1951

ENDURO

thrives on fruit juices

• Republic ENDURO Stainless Steel is a healthy metal. It lives long . . . stays on the job year after year with no time off.

In one eastern bakery, a switch to ENDURO for fruit juice coolers immediately put an end to costly and troublesome replacement problems. After several years of daily contact, juices have had "absolutely no effect upon it." The only maintenance necessary has been routine cleaning. It remains bright and sanitary, and requires "far less effort" to keep clean. From all appearances, it could remain in service indefinitely.

This experience is typical of ENDURO performance reports throughout the food processing industry. ENDURO lasts . . . cuts downtime . . . saves other critical materials.

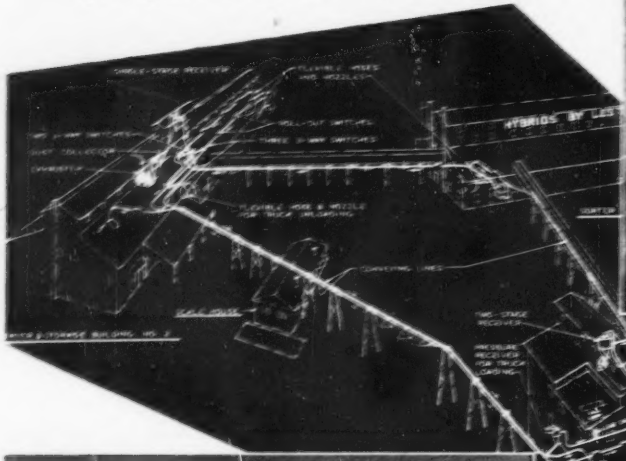
With reasonable care, your present ENDURO equipment will see you productively through the critical days ahead—until new ENDURO equipment again is available in quantity. For prompt answers to any questions concerning proper care of your stainless steel equipment, write:

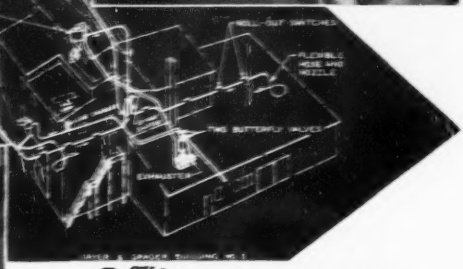
REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Republic
REPUBLIC STEEL
ENDURO® STAINLESS STEEL

Other Republic Products include Ex-L-ite Tin Plate—Pipe—Sheets—Bolts and Nuts—Electrunite Tubing—Stevens Barrels and Drums

have you ever considered **MOVING** *your process material* **BY AIR?**





The AIRVEYOR®

. . . it's cheaper—safer —more efficient!

Moving air has vast carrying possibilities of a swift river. When it's controlled, air supports and transports grain, or any dry pulverized and granular material, at high speed to any pre-determined point.

The Airveyor, serving 243 bins at Pfister Hybrid Corn Company's El Paso, Illinois plant, handling hybrid seed corn, with a minimum of breakage, reduces the cost of in-plant handling and storage. Labor costs are reduced because the Airveyor requires the attention of only one man. Maintenance is at the vanishing point.

Seed corn is only one of the many products that are moved successfully by the Airveyor. Others include barley, grits, meal, malt, oats, rice, rye, wheat, flour, starch, sugar, salt, and many other similar products.

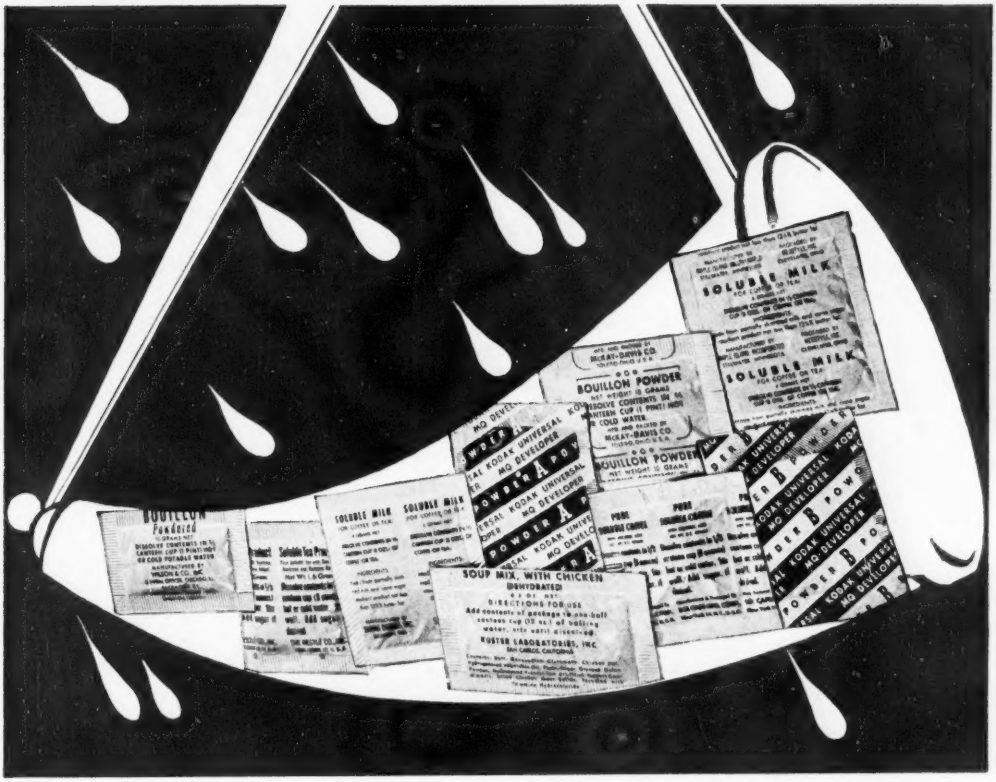
Why not investigate the possibilities of pneumatic handling of foodstuffs in your plant? The Airveyor handles a wide range of dry pulverized and granular food ingredients—economically, speedily and efficiently. Without obligation, a Fuller engineer will analyze your present conveying system and show you how the Airveyor can help in your operations.

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS, AND ASSOCIATED EQUIPMENT

FULLER COMPANY
Catasauqua, Pennsylvania
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

A-121



"Keep Your Powder Dry!"

And the way to do it is to pack your dehydrated, powdered foods and other military or civilian products...in foil coated with VINYLITE Brand Resins.

This not only keeps them dry, but keeps odors out, flavors and freshness in! It is particularly useful for protecting foods, pharmaceutical, chemical, and hundreds of other perishable products that face shipping and handling hazards or are easily contaminated.

Foils coated with VINYLITE Resins heat-seal with ease. And these resins resist water, oils, greases, alkalies, and most strong acids. They are tasteless and odorless. They are impervious to air and liquids. They add strength to foil which they also protect from possible chemical attack.

Available in many colors, transparent, translucent, or opaque, they readily accept multi-color printing. Let us tell you the complete story. Write Dept. KQ-74.

Illustrations and data courtesy The Dobeckmun Company, Cleveland 1, Ohio, and Berkeley 2, California.

Vinylite
BRAND
RESINS

TRADE MARK
BAKELITE COMPANY
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

LET'S TALK FRANK-LY!

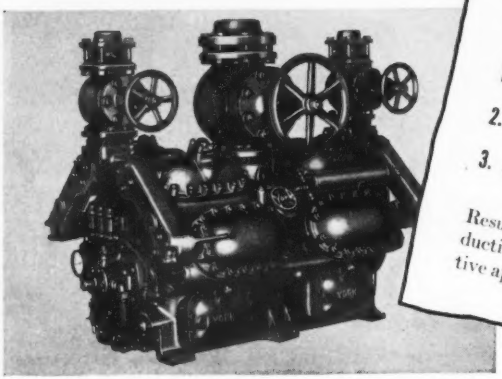
Next time you enjoy that great American institution, the "hot dog", think of this:

Peter Eckrich and Sons, Inc., of Indiana and Michigan, make more than 20,000,000 pounds of fine frankfurters and luncheon meats yearly.

To help them do it better, they use York refrigeration throughout, including York's tough, vibration-free, trouble-free V/W Compressor. York equipment makes possible—at the lowest possible cost—

1. a fine degree of humidity control
2. increased chilling rate
3. excellent weight and shrinkage control

Result—high production economy, reduction of inventory, products of attractive appearance and the desired texture.



YORK'S V/W AMMONIA COMPRESSOR
Available in 4, 6, 8, 12, 16 cylinders. Designed to handle the individual refrigeration job you have in mind . . . It's for you . . . It's from York.

The V/W Compressor's power consumption *drops in proportion to product load*—with power savings up to 72% at 25% load! Thus work schedules can be based on hour-to-hour production plans instead of on fixed machine capacity.

You can always measure York's contribution in terms of bettering business. Let's talk frank-ly—you can't buy better than York!

Check your nearest York Representative, listed in your local classified directory, or write to York Corporation, York, Pennsylvania.

York refrigeration air conditioning

The big advances come from YORK

Headquarters for— **Refrigeration and Air Conditioning**

It's Natural Flavor that sells Food!

This unique seasoning magnifies natural flavor as nothing else can

ZEST guards processed foods from "FLAVOR FADING"

The fresh, natural flavor of your processed foods is too important to leave to chance. Food processors in ever-increasing numbers are relying on ZEST to guard their foods from that enemy of food sales—"Flavor Fading." They have found—and you will too—that a tiny amount of ZEST, pure Monosodium Glutamate, added to foods "locks in" every bit of natural food flavor. ZEST enhances and magnifies this natural food flavor without adding flavor, aroma or color of its own. You will notice only one change in foods when you add ZEST . . . they will taste so much better than ever before that you'll wonder how you ever got along without ZEST! The addition of wonder-working ZEST requires no change in your present processing procedure . . . simply add a small quantity of it before, during or after processing. You can use low-cost ZEST in soups, fish, stews, vegetables, processed meats, poultry . . . and scores of other foods. It makes no difference whether the foods are canned, frozen, or dehydrated . . . ZEST works its seasoning miracle just the same! *Write today* for the full story of ZEST and its sales-boosting abilities.

ZEST®

Pure Monosodium Glutamate

A. E. STALEY MFG. CO., Decatur, Illinois

—MAIL THIS COUPON NOW!—

A. E. Staley Mfg. Co.
Dept. FI-6, Decatur, Illinois

Gentlemen:
I'd like to know more about ZEST . . . the unique food seasoning that makes processed foods taste and sell so much better! Rush me details right away.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

Every bite...OVEN FRESH

Thanks to Cellophane!

Sylvania Cellophane MS-1 in the 300 gauge provides moisture protection for fruited pound cake . . . the product keeps moist and flavorful.

5 important properties that mean successful bakery packaging:

★ Low cost ★ Easy application
★ Durability ★ Grease protection
★ Moisture protection

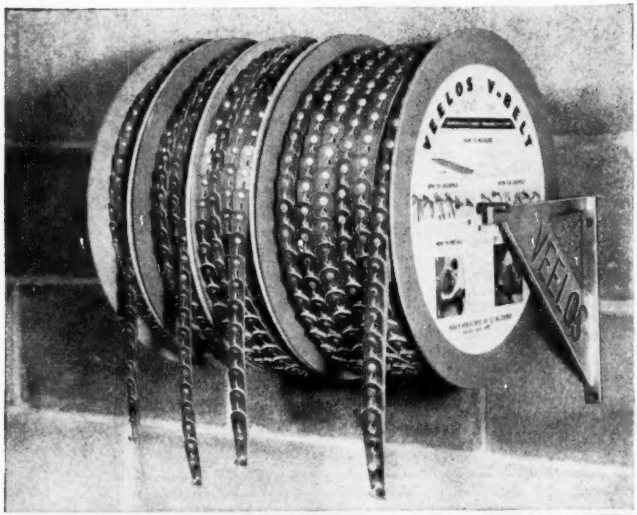
Sylvania is always ready to help you make the most of your cellophane supply. Discuss this problem with your Sylvania representative or write us concerning your application. Address: Market Development, Dept. F-6.

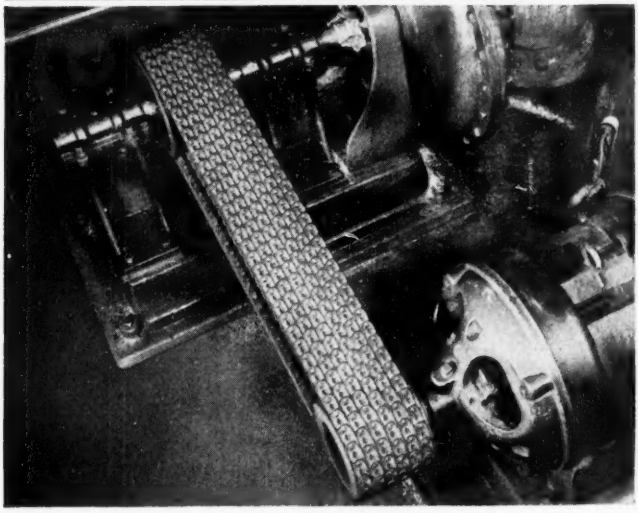
SYLVANIA CELLOPHANE ®

SYLVANIA CELLOPHANE

SYLVANIA DIVISION AMERICAN VISCOSE CORPORATION
Manufacturers of cellophane and other cellulose products since 1929
General Sales Office: 1617 Pennsylvania Blvd., Philadelphia 3, Pa.

Veelos—*the Adjustable V-Belt*
Pays for Itself





In Inventory . . .

Veelos pays for itself by reducing required v-belt stocks. Just 4 reels of Veelos cover *every* v-belt need (up to 316 sizes) in the O, A, B and C widths. Stock only one reel for each width of belt you use—and *any length is readily available.*

In Maintenance . . .

Veelos pays for itself because it can be installed quickly and easily without dismantling outboard bearings or moving motor. Individual belts can be adjusted by simply removing or adding links.

In Operating Efficiency . . .

Veelos pays for itself because uniform tension can be maintained on all belts to provide vibrationless, full power delivery. Simple adjustment of each belt means that *matched sets stay matched.*

Write for your copy of the Veelos Data Book. It gives the complete story on why *Veelos pays for itself.*

MANHEIM MANUFACTURING & BELTING COMPANY
Manheim, Pennsylvania

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all widths in three types; regular, oil-proof and static conducting. Also double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. Veelos is known as VEELINK outside the United States.

VEELOS
THE LINK
V-BELT

PECTINOL *Makes Fruit Products LOOK as Good as They TASTE*

PECTINOL brings to your fruit products eye-inviting clarity, while retaining taste-tempting flavor. Regardless of the product or the process, when PECTINOL goes in, cloudy sediment comes out—*fast!* Your beverages, concentrates, syrups or spreads *look* as good as they taste.

You need no special equipment to use PECTINOL. Just add these special enzymes to pressed juices or mashed fruits, give them a few hours to break down pectic substances, then filter your product clear of sludge and cloudy material. Easy. Inexpensive. Effective.

PECTINOL is used for:

Clarification of Fruit Juices
Clarification of Frozen Fruit Juice Concentrates
Clarification of Wines
Production of Vinegar
Production of Fountain Syrups
Production of Flavor Extracts
Production of Jellies

PECTINOL is effective on:

Apples, Grapes, Citrus Fruits
Cherries, Pears, Peaches
Blackberries, Strawberries
Raspberries, Elderberries, Dates
Loganberries, Papaya, Rhubarb

You'll also find PECTINOL used on fruit and vegetable wastes to recover valuable solids and readily dried presscakes.

OTHER INDUSTRIAL ENZYMES TO IMPROVE YOUR PROCESSING

Enzyme System	Designation	Availability	Action on Substrate
Pectinolytic	PECTINOL	Commercial	Demethoxylates pectic substances and hydrolyzes them to galacturonic acid. pH range 3.5-5.
	Pectin esterase	Experimental	Demethoxylates pectin without hydrolysis of the galacturonic acid chain. pH range 3.5-5.
Proteolytic	RHOZYME P-11	Commercial	Hydrolyze proteins to peptides and amino acids. pH ranges 5.5 - 8.5 (Relative amounts of peptides and amino acids will differ for each proteolytic enzyme.)
	Protease 15	Experimental	
	Protease 16	Experimental	
Amylolytic	RHOZYME S	Commercial	Hydrolysis of starch to dextrins, maltose and glucose. Contain both an alpha amylase and a strong glucogenic principle. pH range 5-6. RHOZYME S is a purified enzyme; RHOZYME T-22 the crude product.
	RHOZYME T-22	Commercial	
	RHOZYME DX	Commercial	Hydrolysis of starch to dextrins. Heat stable. pH range 5.5-6.5.
Lactase	Lactase B	Experimental	Hydrolysis of lactose to glucose and galactose. pH range 6.1-7.5.

For full information regarding PECTINOL, write to:

For the State of California:
A. R. Zacher Company, Inc.
434 P Street
Fresno, California
or 140 Spear Street
San Francisco, California

For Washington and Oregon:
Duncan Equipment Company
506 Broadway
Seattle 22, Washington

For Canada:
Rohm & Haas Company
of Canada, Limited
Terminal Building
Toronto 1, Canada

All other inquiries to Philadelphia office.

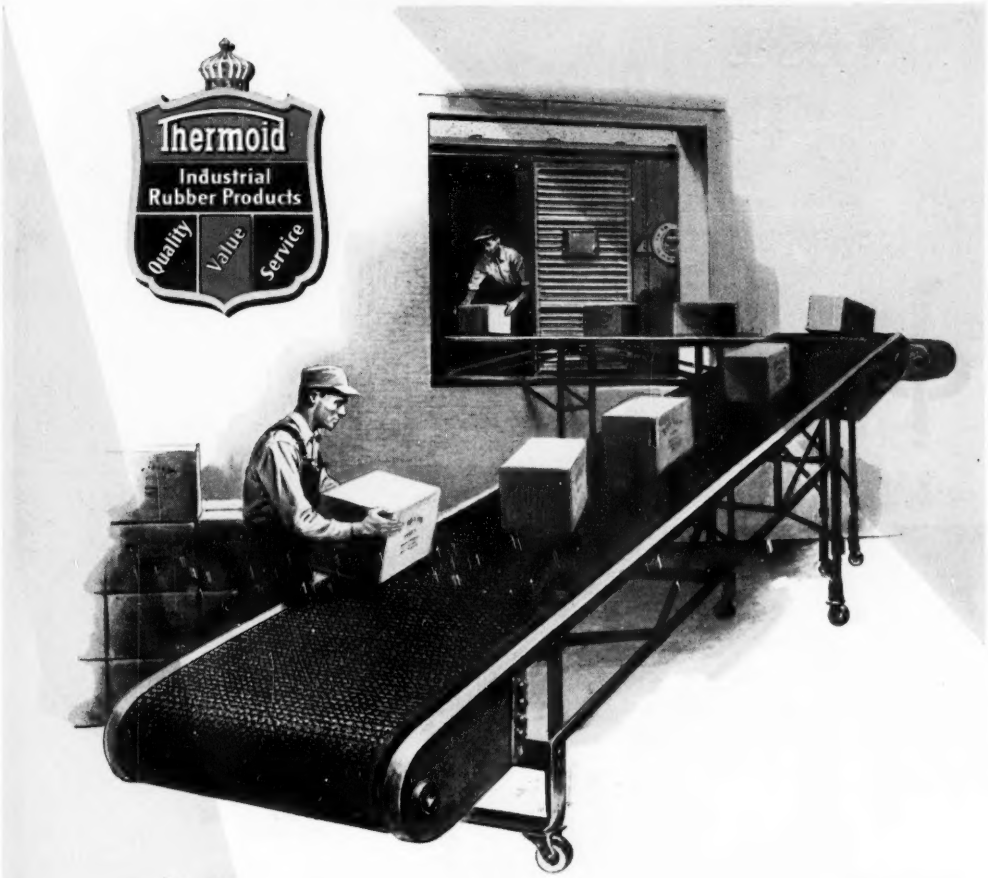
CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

PECTINOL and RHOZYME are trade-marks, Reg. U.S. Pat. Off. and in principal foreign countries.



"Whatever Your Conveyor Belting Problem . . . *Thermoid Has The Answer*"

Perhaps your problem is handling packages on an incline of 25—even 35—degrees. You'll find the solution in Thermoid "Ruff-Top" Conveyor Belting—with its thousands of small, rough, irregular-shaped points of soft rubber that take a firm grip on the lightest packages or cartons.

But whatever the job—whatever the nature of materials to be handled—heavy or light, soft or abrasive, hot or cold, wet or dry, uniform or non-uniform in size—consult your Thermoid distributor. He can recommend the right type of Thermoid Belt to do the job at the lowest cost per ton of material moved.

Thermoid's extra margin of endurance means fewer delays due to belt breakage or premature wear.

Here's The Book That Will Answer Many Of Your Questions

Drop us a line for your free copy of Book No. 3679. It is a handy reference guide, concise and complete. 16 pages of valuable charts, tables and graphs tell how to select the right conveyor or elevator belt for the materials to be handled . . . how to determine capacities, speeds, weights and number of plies.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

BACK IN THE 1880's

WHEN THE FIRST WELDING MACHINE WAS INVENTED

Koven

WAS MAKING INDIVIDUALIZED FOOD EQUIPMENT

12'0" x 17'0" stainless clad jacketed tank

Rotary color mixer with quick opening door

As early as the Inventive 80's, KOVEN was gaining the high regard of food manufacturers through the fabrication of individualized equipment, and today, KOVEN engineering skill and know-how can help you to speedier, more economical and profitable production through individualized equipment designed for your specific requirements. Let us help you with your production problems. Call or write today for a consultation—no obligation.

Our two vast modern plants include: machine, sheet and plate, welding and galvanizing shops, X-ray equipment and stress-relieving furnace. Among the many KOVEN products in all commercial and non-corrosive metals: Stainless Steel; Aluminum Sheet Fabrication; Boxes, Tote, Waste Cans; Chemical apparatus; Coils and Pipe bands; Copper sheet fabrication; Galvanizing Work; Mixers, All Kinds; Monel Metal Fabricators; Pails, Special Heavy; Pans, All Types, All Metals; Sinks, Scullery and Factory; Tables, Galvanized or Monel; Tanks, All Types, All Metals; Kettles, All Types, All Metals. Fabrication to A.S.M.E. Code Par. U-68 and U-69 a specialty.

Plants:
Jersey City, N. J.

Dover, N. J.

L. O. KOVEN & BRO., INC.
154 Ogden Avenue, Jersey City 7, N. J.

KOVEN FOR INDIVIDUALIZED FOOD EQUIPMENT SINCE 1881

Stays clean as a Whistle

INSIDE and OUT

when it's **B&W** Stainless Tubing

Wherever food processing operations involve corrosive services, it's reassuring to know that purity, color, and flavor are guarded by easy-to-clean Stainless Tubing. Because Stainless Tubing is chemically inert to most foods and food-processing solutions, it does not corrode... provides no basis for the mechanical adhesion of contaminating particles—it's easy to clean. And it *stays* clean because of its faculty of "self-healing"—the unique ability of the higher chrome alloys, when abraded or scratched, to renew breaks in their corrosion-resistant surface films of chromium-oxide.

Consult Mr. Tubes—your B&W Tube Co. representative—on your next retubing problem. Let him give you the complete story on the greater-than-ever advantages of Stainless in modern food-processing applications.
Send for bulletin TA-1517.

B&W STAINLESS and WELDED TUBES

THE BABCOCK & WILCOX TUBE COMPANY
***Executive Offices:* Beaver Falls, Pa.**
General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio • Denver, Colo. Detroit 26, Mich. • Houston 2, Texas • Los Angeles 15, Calif. • New York 16, N. Y. • Philadelphia 2, Pa. St. Louis 1, Mo. • San Francisco 3, Calif. • Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

TA-1628-5

power modernization

requires correct production speed

One of the largest can manufacturers* states, *"Sterling Slo-Speed electric power drives replacing worm gearing resulted in:*

- **29% saving in power costs.**
- **25% reduction in connected load.**
- **One service job on one unit in 360 unit years of operation."**

*(Name upon request)

Rugged

STERLING

SLO-SPEED

GIVES YOU THE ONE BEST SLOW SPEED AND

gives uninterrupted service—provides versatile mounting and flexibility in arrangement of machinery—saves valuable space—provides greater safety—costs less to install and use. An indispensable source of slow speed power for:

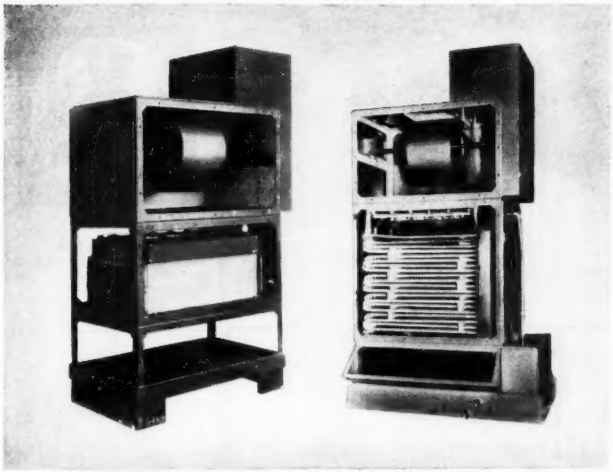
Agitators	Dryers	Presses
Blenders	Feeders	Pumps
Blowers	Kilns	Screens
Conveyors	Mills	Tumblers
Cookers	Mixers	Etc., etc., etc.

Ask for your copy of pictorial bulletin No. E-60, showing Sterling Electric Power Drives Turning The Wheels of Industry.

STERLING ELECTRIC MOTORS

Plants: New York 51, N. Y.; Los Angeles 22, California; Hamilton, Canada; Santiago, Chile.

Offices and distributors in all principal cities.



What Make of Product Cooler Will Do Your Job Best?

Here's where the wide selection of cooling and freezing equipment made by Worthington really pays off.

From the complete Worthington line, you can pick exactly the right unit to meet your specifications of:

- medium or low temperature
- automatic defrosting—periodic or continuous
- capacities from 2 to 37 tons of refrigeration
- air circulation rates from 1600 to 16,000 cfm
- direct air discharge or with ductwork
- various arrangements for air inlet and discharge

Worthington's dry-coil type (UCY) for medium and low temperatures uses ammonia or Freon-12 and may be equipped with automatic water defrost. The recirculating-spray (continuous automatic defrost) type (UCZ) uses ammonia or brine. Five sizes of each type. Finned copper coils for high air-contact efficiency with Freon; prime surface steel coils for ammonia or brine.

Features—quick, uniform flow of cold air throughout, no dead spots . . . automatic operation . . . automatic defrosting . . . sectionalized construction with removable panels . . . forward-curved centrifugal fans for quiet operation . . . surge drum and float valve assembly available . . . pump-motor units (also Worthington-made).

FOR LONGEST LIFE—Copper tubes for Freon, hot-dipped galvanized steel tubes for ammonia and brine . . . Sections fabricated from sturdy No. 11-gauge steel angles electrowelded and reinforced with heavy gussets . . . All-steel cover completely covers motor and drive . . . Large-volume drain pan constructed of galvannealed steel, electrowelded . . . Entire unit, including drain pan, bonderized and covered with a rubber-base enamel, containing corrosion-inhibiting metallic powder.

Write for Bulletin C1100-B35.

A-16

WORTHINGTON

AIR CONDITIONING AND REFRIGERATION

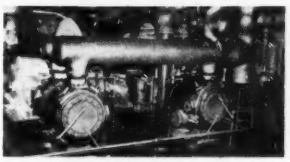
How Cold Do You Want It?

From the complete line of Worthington equipment—all *manufactured*, not just assembled by Worthington—you can get the maximum variety of refrigerating equipment.

Typical of this variety are the following:

John Morrell & Co. plant at Topeka, Kansas

At John Morrell & Co.'s Topeka plant, a Worthington Uniflo horizontal ammonia compressor is completing its tenth year helping to chill and freeze meat products at temperatures ranging from 0 to 60 degrees. This steam-driven compressor was installed in 1940, and is still operating efficiently on around-the-clock service.



Worthington steam-driven ammonia compressor in John Morrell Plant

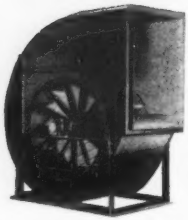
Worthington refrigeration equipment operated by Coastal Dairy Products

Ice cream is the job handled by Worthington compressors at Coastal Dairy Products, Wilson, N. C. Three vertical ammonia compressors and one ammonia booster compressor are used to pre-cool the mix to 40 F, freeze at about 0 F, and then harden at minus 20 F.

INVESTIGATE

MORE WORTH WITH WORTHINGTON

Consult Classified Telephone Directory for nearest Worthington distributor. Worthington Pump and Machinery Corporation, Air Conditioning and Refrigeration Division, Harrison, N. J., specialists in air conditioning and refrigeration for more than 50 years.

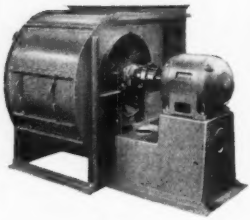


LIMIT-LOAD FANS

For large-scale ventilation. Quiet, non-overloading. Sizes up to 500,000 c.f.m. Bulletin 3675.

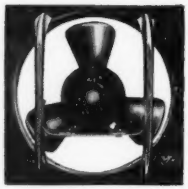
AXIAL FLOW FANS

For light-duty ventilation and air conditioning service. Compact, non-overloading. Bulletin 3533-C.



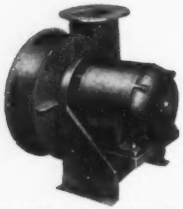
POWER PLANT FANS

Primary, forced draft, induced draft — built for the severest service. Bulletin 3750.



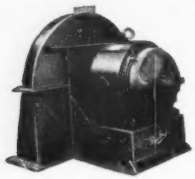
BREEZO FANS

Easy-to-install wall fans. Durable and very economical. 6 sizes. Bulletin 3222-F.



TYPE "CB" PRESSURE BLOWERS

For single-stage pressure blowing up to 2¼ pounds per square inch. Bulletin 3553-A.



TYPE "CC" PRESSURE BLOWERS

In sizes for pressures up to 4 pounds and capacities up to 75,000 c.f.m. Bulletin 3553-A.

BABY CONOIDAL FANS

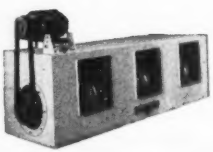
Compact, for portable or duct-connected service. Quiet, efficient. Bulletin 3499.

INDUSTRIAL EXHAUSTERS

With interchangeable wheels for air exhausting or materials conveying. All-welded. Bulletin 3576.

"E" BLOWERS—EXHAUSTERS

For oil or gas furnace blowing, line boosting, cleaning. Bulletin 3014-C.



SHORTBOY VENTILATING SETS

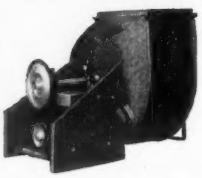
New high efficiency all-aluminum blowers with hollow shaft. Bulletin 3701.

BELT-AIR FANS

Efficient, quiet wall fans for free-air delivery up to 19,000 c.f.m. Bulletin 3222-F.

VOLUME FANS

For blowing or exhausting, up to 10" s.p. 8 discharge positions. Bulletin 3615-A.



BELTED VENT SETS

Compact, "package" fans for duct or free-air delivery. Non-overloading. Bulletin 3720.

"RE" BLOWERS—EXHAUSTERS

Larger versions of "Buffalo" "E" Blowers, in sizes from 50 to 1600 c.f.m., for pressures up to 40" of water.

"Buffalo" BUILDS THE *RIGHT* FAN FOR THE JOB

Whether you need to ventilate a small room or an entire factory — clean tools with air or give your boiler system the most efficient mechanical draft — "Buffalo" builds the fan for the job! And whatever "Buffalo" fan you pick, you can know that its performance is backed by 73 years of "air know-how". Take a look at the fans shown here, and write us for engineering bulletins by number on any that might fit your particular application!

BUFFALO FORGE COMPANY

152 MORTIMER STREET, BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Branch Offices in all Principal Cities

—And For PUMPS . . .

. . . you'll find a rugged precision-built "Buffalo" Centrifugal Pump of the right design, the right metal or alloy and right capacity to handle your liquid-moving job most efficiently. WRITE FOR FACTS!

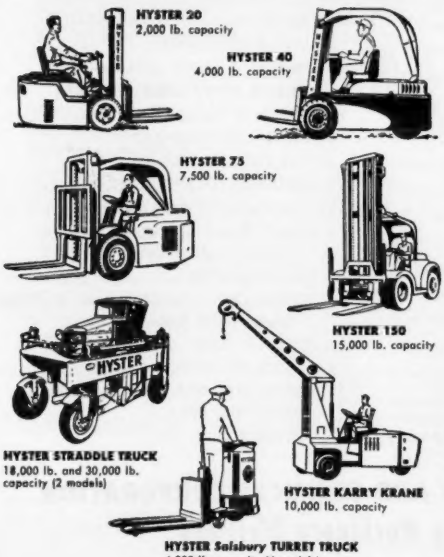
BUFFALO PUMPS, INC.

152 MORTIMER STREET, BUFFALO, NEW YORK

Canada Pumps Ltd, Kitchener Ont.

Branch Offices in all Principal Cities

How to make your HYSTER® LIFT TRUCKS last more years



Put yourself in the hands of your Hyster Company dealer. He can keep your lift trucks running better at lower cost. He has factory trained mechanics who *know* Hyster equipment. He backs up skilled mechanical knowledge with an efficient parts department.

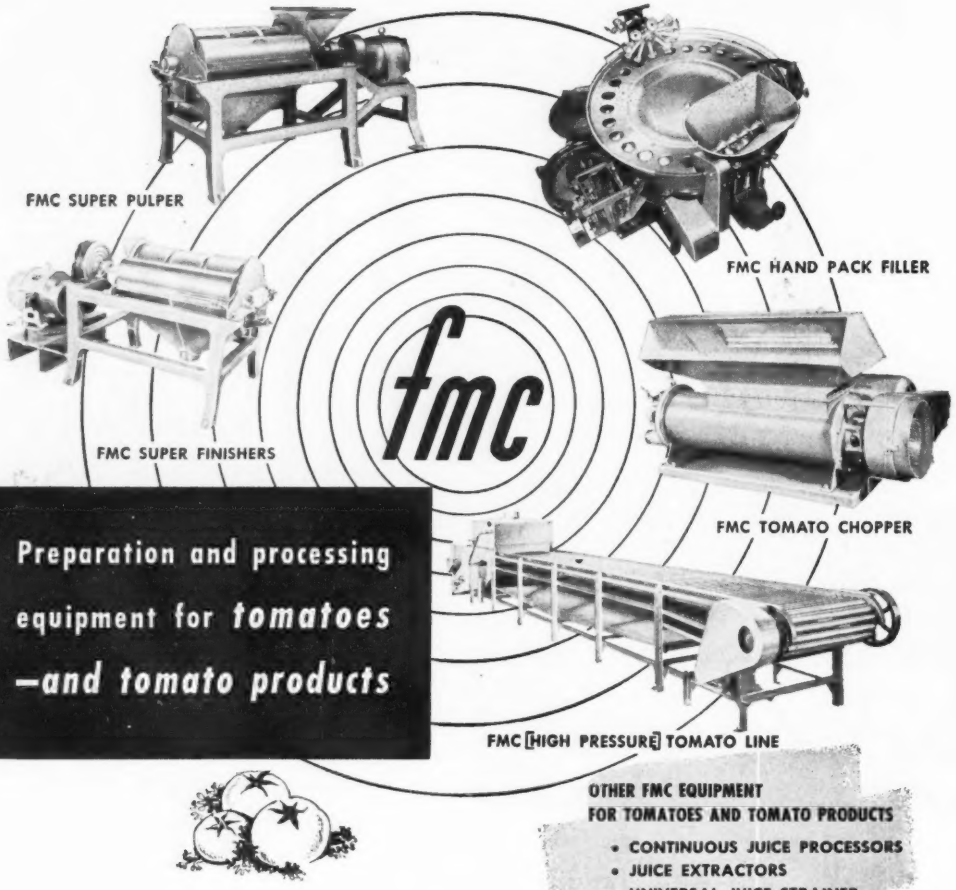
Service is his business. And with Hyster lift trucks hard to get, we suggest that you rely upon your dealer to keep your equipment working at full capacity longer.

HYSTER COMPANY

THREE FACTORIES

2902-35 N. E. CLACKAMAS ST. . . . PORTLAND 8, OREGON
1802-35 NORTH ADAMS STREET. . . PEORIA 1, ILLINOIS
1010-35 MEYERS STREET. . . . . DANVILLE, ILLINOIS

HYSTER



Preparation and processing equipment for *tomatoes* —*and tomato products*

FMC's extensive and complete line of expertly engineered equipment embraces every phase in the preparation and processing of tomatoes and tomato products. Specially designed and built in accordance with modern flow line techniques, this high quality FMC equipment meets every requirement in handling tomatoes fresh from the field until they are fully processed and sped to markets. FMC's experienced engineering staff is available at all times to assist canners and processors in finding the solution to specific problems. You are invited to avail yourself of this valued FMC service.

Write for full information on this outstanding FMC equipment, or call your nearest FMC representative.

OTHER FMC EQUIPMENT FOR TOMATOES AND TOMATO PRODUCTS

- CONTINUOUS JUICE PROCESSORS
- JUICE EXTRACTORS
- UNIVERSAL JUICE STRAINER
- TURBINE DRIVE JUICE STRAINER
- MODEL 15 TOMATO WASHER
- FLOOD TYPE WASHERS
- PAN OR BOX WASHER
- COMBINATION PEELING TABLE
- [LOW PRESSURE] TOMATO LINE
- FILLERS (Hand Pack, Juice, Vacuum, Plunger Type, Utility)
- CONSISTOMETER
- CONTINUOUS COOKERS AND COOLERS (Pressure and Atmospheric)
- HEATING COILS
- ROLLER INSPECTION TABLES
- AUTOMATIC BOX AND STACKED BOX DUMPERS
- SCALDERS

First in Diversified Food Equipment

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Divisions

General Sales Offices:

EASTERN: HOOPESTON, ILLINOIS WESTERN: SAN JOSE 6, CALIFORNIA

A completely new and different type of

Wetting Agent-Detergent

NYTRON

TRADE-MARK REG. U. S. PAT. OFF.

FOR FOOD PLANT CLEANING

In HOT or COLD, HARD or SOFT WATER, NYTRON cleans thoroughly . . . rinses completely without leaving a sticky residue or deposit.

Equipment Cleaning

Fruit and Vegetable Washing

Floor and Wall Cleaning

NYTRON Improves Cleaning Action of Alkalies and Acids.

USE NYTRON WITH CAUSTIC

for Fruit Peeling
Bottle Washing
Other Special Cleaning Jobs

USE NYTRON WITH ACID

for Tile Cleaning
Removing Milkstone
Removing Lime Scale
Other Special Cleaning Jobs

A SOLVAY PRODUCT

It lowers the cost of your cleaning operations because less is required to do a thorough cleaning job! *It increases efficiency* because it combines powerful cleaning action with dependable safety! Here are the details of what NYTRON can do for you . . .

. . . NYTRON cleans walls, floors and painted surfaces without removing paint, without affecting tinned or plated surfaces. It washes tile and glassware without streaking; it completely removes oils, fats and greases. NYTRON rinses thoroughly and quickly—even in cold water—leaving no film or deposit to harbor bacteria. It works equally well in hard or soft water . . . leaves no cloudiness, no spots even in the hardest water. And NYTRON is safe, mild and non-toxic—will not affect normal skin!

Samples of NYTRON

—as well as detailed information and technical data on its uses in the food industry—are available on request. Get all the facts . . . see for yourself how NYTRON can help your business operate more efficiently, more profitably. Mail the coupon today.

SOLVAY SALES DIVISION, Allied Chemical & Dye Corporation
40 Rector St., New York 6, N. Y.

I want to know more about NYTRON, the entirely new type (patented) WETTING AGENT-DETERGENT, and its uses in the food field. Please send me free samples plus detailed non-technical information and specific technical data.

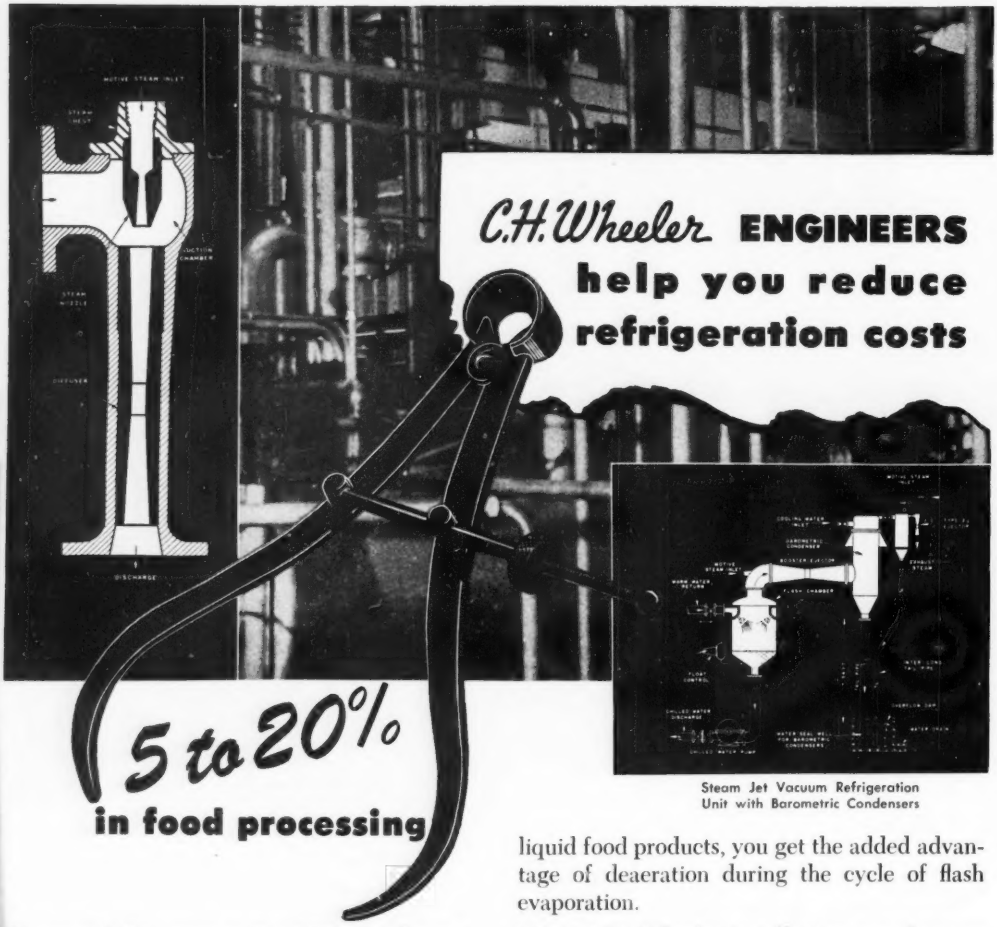
Name_____

Title_____

Company_____

Address_____

City_____ Zone No._____ State_____ FI-651



C.H. Wheeler ENGINEERS help you reduce refrigeration costs

5 to 20% in food processing

Steam Jet Vacuum Refrigeration Unit with Barometric Condensers

They can help you save 5 to 20% over the cost of mechanical refrigeration, if you have live or exhaust steam available, and require moderate chilled water temperatures from 35° to 65°F. Purchase price is lower, because units are standardized in a wide range of sizes. Installation costs less. And – most important of all – long range maintenance cost is lower. There are no moving parts in the system except the chilled water pump.

Employing only water, cooled by flash evaporation, you eliminate hazards of noxious and poisonous refrigerants. In direct cooling of liquid food products, you get the added advantage of deaeration during the cycle of flash evaporation.

Most C. H. Wheeler installations are of a confidential nature. Our engineers will be glad to work with you in applying the correct vacuum equipment for your process.

Catalog 1462, yours for the asking, has many suggestions and charts of value to you who have a vacuum or refrigeration problem.

C.H. Wheeler OF PHILADELPHIA

VACUUM REFRIGERATION—COOLING TOWERS—HIGH VACUUM PROCESS EQUIPMENT—MICRO-PARTICLE REDUCTION MILLS—STEAM CONDENSERS—STEAM JET EJECTORS—MARINE CONDENSERS & EJECTORS—DECK MACHINERY

C. H. WHEELER MANUFACTURING CO., 1828 SEDGLEY AVE., PHILADELPHIA 32, PA.

REPRESENTATIVES IN MOST PRINCIPAL CITIES

LONG HAUL OR SHORT HAUL...

Salerno gets there faster...at less cost with FRUEHAUF TRAILERS

Famed as a model of the baking industry, Salerno's Operation is completely streamlined and Salerno prides itself in getting its fresh-from-the-oven products on dealer's shelves in the shortest possible time via Fruehauf Trailer.

SALERNO is Chicago's leading baker of quality cookies and crackers. The constantly growing demand for Salerno products in Chicago and the middle west calls for a fast, highly flexible direct-to-door delivery system. In Fruehauf Trailers Salerno has found the answer to operating efficiency at the lowest possible cost.

The food field is just one of over 100 different industries—businesses large and small—finding in Fruehauf Trailers the way to faster, lower-cost distribution. It will pay you to investigate their use in your business.

Write today for Fruehauf's *free* catalog of equipment — full information on the world's most complete line of Truck-Trailers. The Fruehauf Trailer Co., 10956 Harper Ave., Detroit 32, Mich.

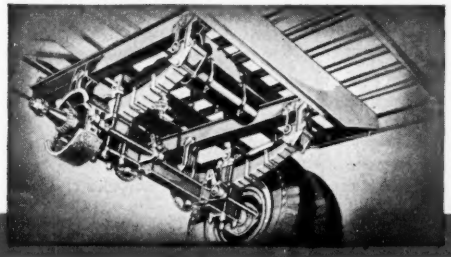
FRUEHAUF

WORLD'S LARGEST BUILDERS OF TRUCK-TRAILERS

Trailers

YOUR DAILY FOOD, and nearly all your everyday necessities, are brought to you all or part way by Motor Transport. As our No. 1 transportation system, it employs 1 out of every 7 American people.

GREATER LOAD CUSHIONING is provided in Fruehauf's patented "Multi-Rate" Suspension. Trailer rolls smoother, providing proper springing for all road or load conditions . . . from no load to overload. Free rolling, cushioned, level ride cuts product damage, increases tire life, saves gas — easier on driver, too.



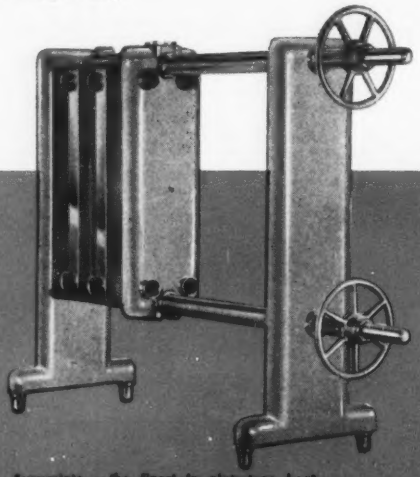
GREATER LOAD PROTECTION is provided in Fruehauf's patented Integral-Frame construction of hi-tensile pressed steel. This rugged all-welded bridgework gives greater strength with less weight . . . for bigger payload capacity. Trailer is engineered . . . roofs, doors, floors and insulation . . . for long life with low upkeep.

SAVE THROUGH CONTINUOUS

PASTEURIZING
REGENERATING
HEATING
COOLING
with

Superplate

the SANITARY PLATE-TYPE HEAT EXCHANGER



Superplate — the finest in plate-type heat exchangers. Available in stainless steel or painted finish. A size for every plant.

Superplate is fast becoming a favorite plate-type heat exchanger in the food industry because it offers many savings over the less efficient batch-type operations of the past. For example, the exclusive knob-type stainless steel plates split the product into a thin stream for more intimate heat contact and develop the turbulent flow that speeds heat exchange . . . saving on fuel, steam, water and power costs.

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Ask your Cherry-Burrell representative about the many savings possible in your plant through continuous processing with Superplate. Also, be sure to ask about Superplate flexibility which allows easy expansion . . . simple, low-cost conversion to greater capacity when needed.

For a finer product — at lower cost — use the finest in plate-type equipment . . . Cherry-Burrell's Superplate.

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With more and more restrictions being imposed on material and manpower, it is becoming increasingly apparent that a thorough, well-planned equipment maintenance program is important in every plant. All equipment — even such fine, high-production machinery as Superplate — must be carefully tended to assure maximum output per man-hour, day in, day out. Bulletins describing latest maintenance procedures on all Cherry-Burrell equipment, including Superplate, will be available soon. Use the coupon to get your copies and start a planned maintenance program — now!

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Trendmaker in a great industry

FOOD ENGINEERING AWARD goes to canner for application of revolutionary Martin aseptic process.

AWARD FOR PROGRESS

To Andersen's Foods for continuous short-high aseptic canning system

ANDERSEN'S FOODS, INC., Santa Barbara, Calif., wins the 1951 FOOD ENGINEERING Award for outstanding achievement in food technology.

The winning process is continuous short-time high-temperature sterilization of pea soup, combined with aseptic canning—the Martin process of James Dole Engineering Co. Put into successful commercial operation by Andersen's, short-high aseptic canning is having an impact on several branches of the food processing industry.

An almost revolutionary departure from conventional canning methods, the process has been approved by the California Public Health Department. Applicable to many flowable foods, the process produces a finished product of improved flavor, color, texture and vitamin content.

Being a continuous automatic operation, it is efficient in heat and water utilization, and economical of labor and floor space. It permits measurement and control of actual product temperature during sterilization. The quality of the product is the same for large as for small containers. And the short-high process has wide latitude between adequate sterilization and over-cooking or scorching.

Active interest in such a process goes back more than two decades. And in recent years a great deal of experimental work has been carried out by Dr. W. McK. Martin, in cooperation with food processors and technologists in the canning field. Andersen's Foods recently put the process into commercial operation, and other food companies have been working with it. Among them is Med-O-Milk, Inc. which is just starting commercial aseptic canning of fresh milk.

The Andersen pea soup process won the award on the basis of its broad significance to the food processing industry, plus these important factors: It involves originality in ideas and application of basic principles. It is relatively simple and free from probable operating delays and mechanical difficulties. And it embodies high standards in respect to sanitation, purity, appearance and quality of product.

The committee which selected the process as the winner of the FE Award was appointed by the Institute of Food Technologists and is composed of 26 food technologists connected with universities and colleges. The chairman is Dr. Samuel C. Prescott, Dean Emeritus of Massachusetts Institute of Technology.

The Ingredients

Robert T. Andersen, president of Award winning company, exhibits vegetables, seasoning and water that go into three cans of finished product.

Cooking the Soup

Ingredients are cooked in 100-gal. steam-jacketed stainless steel kettles equipped with agitators. Mr. Andersen offers taste to plant visitors.

CONTINUOUS ASEPTIC PROCESS

Its Basic Principles—Its Benefits—and Its Impact on Industry

SUCCESSFUL commercial performance of the continuous short-time high-temperature aseptic canning system in Andersen's pea soup plant is testimony to its merits. Conventional canning methods were not considered satisfactory for this soup, a delicately flavored product originally developed at Andersen's Valley Inn and for many years a specialty item on the menu.

How Andersen makes, processes and cans the soup is detailed in the picture flowsheet (page 134). (See also Aseptic Canning in Action, pages 72-74, Feb. F. I.)

Further evidence of the significance of the process is its commercial application to the canning of fresh milk by Med-O-Milk, Inc. (See page 71.)

Presented here is information on the basic process, its benefits, and its planned and projected applications, as explained by Dr. W. McK. Martin, James Dole Engineering Co.

Four Operations Involved

This process differs from conventional canning methods in that the product is quickly sterilized at a high temperature and cooled before it is sealed in the can. The canning procedure consists of four separate operations which are carried out simultaneously in a closed interconnected system as a continuous process. The operations are:

1. "Flash" sterilization of product at high temperature (270-300 deg. F.) by pumping it successively through heating, holding and cooling sections of a closed heat-exchange system (tubular, plate or Votator type).

2. Sterilization of the containers and covers with superheated steam.

3. Filling of the cool sterile product into the sterile containers.

4. Aseptically sealing the containers with sterile covers.

Product-sterilizing operations are maintained under pressure. And filling and sealing operations are carried out aseptically in an atmosphere of superheated steam, or other sterile inert gas, thus precluding any possibility of contamination.

All of the various operations are synchronized mechanically so that the product, containers, covers and finished canned product move through the system without interruption.

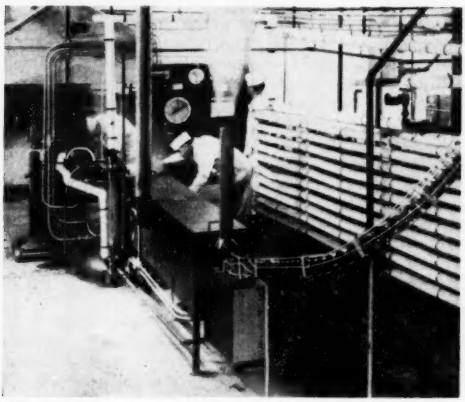
A summary of the different steps carried out simultaneously in the operation of the process follows:

Sterilization of Product and Containers

The product is pumped continuously under pressure through the heating section of the cooker, in which it is quickly heated to sterilization temperature. Then the product passes through a holding section to accomplish complete sterilization. Finally, it goes through a cooling section directly to a filler. Process temperature is automatically controlled and recorded. Process time is controlled by the rate of flow of product through the system, which is maintained constant by a multiple-piston pump operating at constant speed.

In effect, the heat-exchange system constitutes a continuous-flow pressure cooker. It does not differ in principle from the conventional "in-the-can" pressure cookers or retorts, insofar as the lethal effect of time and temperature in the destruction of bacterial spores are concerned. It merely provides for the use of extremely short process times at high temperatures such as cannot be realized by conventional methods.

Cans are sterilized with superheated steam at 450-550 deg. F. as they are conveyed continuously through the can sterilizer to the filler. The temperature of the superheated



After cooking, soup is quickly sterilized and cooled in continuous heat exchanger to preserve delicate flavor. Soup then is aseptically canned.

steam is thermostatically controlled, and the time of exposure of the cans to the steam is regulated by the speed with which they are conveyed through the sterilizer.

Covers also are sterilized with superheated steam. The sterilizer is attached to, and operated as an accessory part of, the closing machine. Steam temperature and exposure time are positively controlled.

Aseptic Filling and Sealing

As the cool sterile product flows continuously from the heat exchanger, it is filled into the sterile cans as the latter are conveyed from the can sterilizer through the filler. The filled cans are then conveyed directly to the closing machine, which applies sterile covers from the cover sterilizer.

An atmosphere of superheated steam is maintained in the filler, closing machine and intereonnecting conveyor system to maintain sterility and to prevent entry of airborne bacteria. The outward flow of superheated steam through joints and other openings in the equipment is a simple and effective safeguard against atmospheric contamination.

Complete Instrumentation

Accurate and dependable temperature controls are an essential part of the aseptic canning process. Temperature controlling, recording, indicating and alarm instruments are therefore provided at all points where temperature is involved, either in the sterilization process or in aseptic canning.

Certified mercury thermometers are used to check the temperature controlling and recording instruments. Separate minimum-temperature alarm instruments are used for a two-fold purpose: If the temperatures anywhere in the system fall below predetermined critical levels, the operator is warned and cans are diverted from the line.

All of the minimum-temperature instruments are connected in circuit with green "ready" lights on the instrument panel. The lights glow only when the temperatures are at or above the predetermined operating level. The position of trouble in the system is thus shown by the lights on the panel at the time the audible alarm is sounded and the red danger light is flashed on.

The temperature-control system is interlocked with the canning operations. When cans are moving through the filler a "run" record is made on the 8-point strip chart, along with the temperature records. The minimum-temperature alarm signal also is connected in the circuit. A relay actuates a pen to make a continuous "alarm" record on the strip chart when any of the temperatures drop below predetermined levels.

Coding Tied to Temperatures

Sealed cans are code marked as they are conveyed from the closing machine to the labeler. Embossed codes cannot be applied to the covers, as the latter are fed through the closing machine. The reason is possible contamination and damage to the enamel lining at the elevated temperatures. Application of the codes to the cans after they are sealed ties the coding operation into the temperature-control system.

Process Is Fast and Simple

Canning speeds up to 300 cans per minute with consumer-size cans, and proportionately slower speeds for large or institutional-size cans, are provided by different-size units.

In developing the process, the equipment was designed to meet practical operating conditions and to provide a wide margin of safety in the sterilization of the product, containers, closures and accessory apparatus.

The equipment is simple, and economical in the use of fuel, water and labor. For the products for which it can be used, it is capable of producing a finished canned product of noticeably improved quality.

Quality of Finished Product

Short high-temperature sterilization (5 to 10 sec. at 280-290 deg. F.), used in conjunction with the aseptic canning method, generally produces a finished product of better flavor, color and texture than an equivalent process in the lower temperature range (40-70 min. at 240-250 deg. F.).

Heat-sensitive products may be sterilized without serious degradation of delicate flavoring constituents and color pigments. Bananas, for example, may be pureed and canned with little loss of the delicate flavor. Similarly, colored products such as beets retain both the pigment and flavorful constituents of the fresh product. By the same token, vitamins are retained to a high degree.

Large as Well as Small Cans

Product quality is the same for large as for small containers. This is especially important in products which are difficult to process because of heat sensitivity or poor heat-transfer properties. Fruit and vegetable juices, purees, baby foods, soup stocks, pumpkin, cream-style corn, tomato paste, and cream soups can be packed in large cans without sacrificing quality. This also applies to other "difficult-to-process" products such as milk, milk products and starch or custard type dessert items.

Direct Measurement and Control

Use of heat-exchange equipment in which the product flows continuously through the heating, holding and cooling sections allows precise control. It permits *actual* measurement of the temperature attained by the product, irrespective of its heat-exchange properties.

Process temperature is thus actually measured and recorded by the control instruments, rather than assumed on the basis of indirect temperature measurements. Moreover, the process time is accurately controlled by the constant rate of flow of product through the heat-exchange system.

Wide Margin of Safety

There is an extremely wide latitude between adequate sterilization and over-cooking. Tests on a wide variety

of products show that the process can be increased to double, triple—or even ten times—that required for complete sterilization. And there is no perceptible difference in quality. This permits a wide margin of safety in the sterilization process without sacrificing quality in the finished product.

Public Health Aspects

Need for effective safeguards against botulism and other food spoilage hazards was recognized at the outset of the developmental work. Extensive tests were therefore carried out with the assistance of Dr. J. Russell Esty and Mr. C. T. Townsend of the National Canners' Association, and in collaboration with others in the can manufacturing and canning industry.

Bacteriological studies included extensive tests on the sterilization of the product, cans, covers and equipment, and on maintaining sterile conditions in the filling and sealing operations. The results of these tests, together with the safeguards provided by dependable instrumentation, were important considerations in the approval of the process for commercial operation in California. Under this approval, the aseptic canning process will be operated under state inspection similar to that required for conventional canning processes.

Has Impact on Industry

How great the impact of this aseptic canning process is on the food processing industry is indicated by the work being done with it—in addition to the Andersen and Med-O-Milk applications.

Bordo Products Co., Winternaven, Fla., is doing development work on aseptic canning of single-strength and concentrated (3 to 1) unfrozen orange juice.

Golden State Co., Ltd., San Francisco, has an aseptic unit and, like many other dairy companies, is working toward a canned sterile milk.

National Dairy Research Laboratories, Oakdale, N. Y., has had a unit for several months.

Borden Co., Special Products Div., has installed the aseptic system at its Elgin, Ill., plant.

Avoset Co., San Francisco, has purchased a unit for the canning of sterile cream, formerly bottled under a different process.

Food Concentrates, Inc., product subsidiary of United Fruit Co., has an aseptic installation with which it will can banana puree for use in baby foods, and for use by confectioners and bakers.

Other projected applications for the Martin system include the processing of baby foods, coconut milk, grapefruit juice and lemonade, cream-style corn, creamed peas, diced carrots, diced celery and asparagus, canned ice cream mix and milk shake.

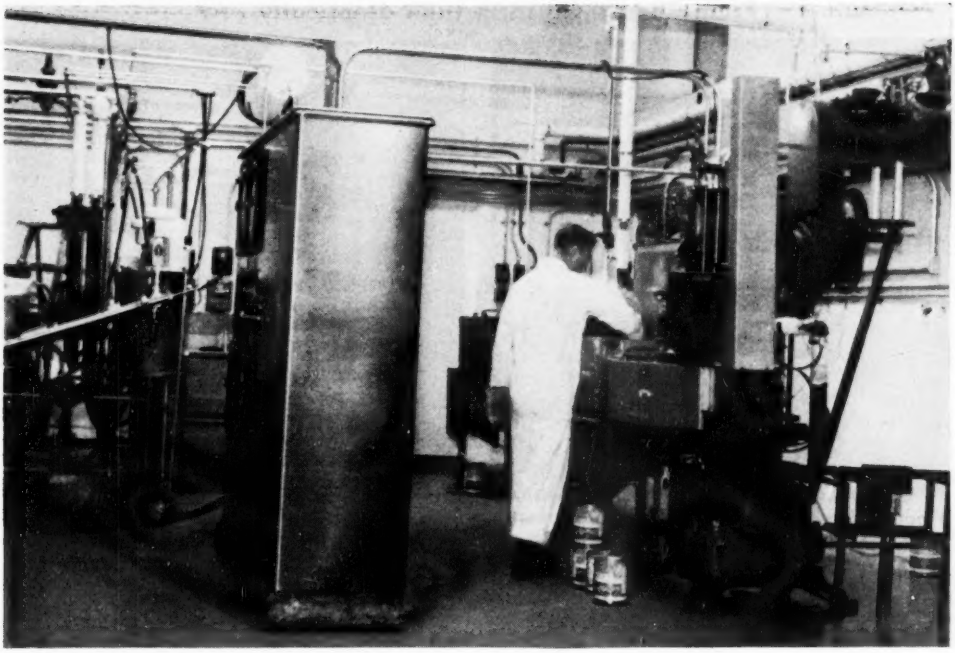
Under the sponsorship of Glass Container Manufacturers Institute, a development program for adapting the process to glass containers is well advanced.

A summary of 38 products experimentally packed by the continuous aseptic system is given in the accompanying table. It includes 263 packs.

There is no doubt that the short-high aseptic canning system is a process with a future.

Summary of Products Packed Experimentally by Aseptic Canning Process

Products	Process Temperature (Range) Deg. F.	Sterilization Value (Range) F_s	Number of Experiments Packs	Number of Samples Packed Cans
Apple juice	225–281	0.01–10	2	194
Apple sauce	218	.....	2	290
Bananas (pureed)	263–293	1.9–10.7	10	664
Beans, strained	280–294	6–19	3	210
Beets, strained	280–300	8–100	11	1358
Carrots, strained	280–290	6	2	196
Carrott juice	264–288	6–10	4	362
Chicken soup	281–287	10–22	2	204
Cream	276–299	9–205	8	914
Curry sauce	278	25	1	50
Custard pudding	270–323	0.4–8,400	16	1329
Horse radish sauce	284	26	1	50
Ice cream mix	264–300	1.2–205	4	267
Infant food "A"	264–297	9–11	5	675
Infant food "B"	287–326	20–12,200	9	1266
Lemonade concentrate	164–177	.....	2	120
Meats, strained	263–295	5–110	28	1820
Milk, chocolate	276–304	5–205	58	6334
Milk, evaporated	264–288	10	3	602
Milk, whole	276–296	3–205	12	912
Mushroom soup	283	10	1	120
Olive soup	283–298	12–82	6	610
Orange juice	185–205	.....	5	320
Orange juice concentrate	177–212	.....	5	390
Orange pudding	281–298	8–83	5	592
Peas, strained	277–297	6–74	4	390
Pea soup	277–297	7–79	15	1726
Plums and farina	270–290	0.5–3.2	2	209
Prune nectar	215	0	1	106
Pumpkin	282	20	3	215
Spinach, strained	280–311	6–480	8	663
Squash, strained	288–297	3–30	5	537
Tomato juice concentrate	257.5–276	0.5–5.3	4	260
Tomato soup	260–290	0.1–5	3	144
Vegetable soup	290	5–21	2	116
Vegetables, mixed	281–329	10–10,000	7	740
Vichysoisse soup	284–287	15–22	3	93
Welsh rarebit	287	22	1	40
		Totals.....	263	25,088



KEY UNITS in new process. Flash sterilizer and cooler (left); control panel (center); Martin aseptic canner (right).

Canned Fresh Milk Now a Reality

It is handled aseptically from cows to cans, with flash sterilization enroute. Product retains original fresh flavor for extended periods without aid of refrigeration

RAY BLOOMBERG and F. E. HESSEY
Northwest Correspondent, "Food Engineering," and
Food Application Engineering Representative,
Brown Instrument Div., Minneapolis-Honeywell Regulator Co., respectively

Canned whole milk that will keep 4 to 6 months without refrigeration is now produced by Med-O-Milk, Inc., in a new $200,000 plant at East Stanwood, Wash.

Termed comparable in every way with fresh pasteurized milk, the product is handled in special equipment designed to prevent contact with air from the time the milk leaves the cow's udder until it is ready for consumption.

Special technics employed in this handling and processing were developed by Dr. R. R. Graves and Mr. John H. Stambaugh of International Milk Processors, Inc., Chicago. Canning is by the Martin aseptic machine.

In spite of the high sterilizing temperature used, the product exhibits no cooked flavor. This is attributed principally to the prior treatment of the milk and to the fact that each particle receives the same heat treatment.

■ **Success of this process on a product as heat-sensitive as milk indicates that a similar approach with other foods could well lead to a technological revolution in the industry.**

The developers plan to license the process to other companies for production of sterile, canned milk.

Should Solve Alaskan Problem

The new method promises to alleviate the transportation difficulties involved in supplying "fresh" milk to distant places. In Anchorage, Alaska, for example, fresh milk now sells at 55 to 78c. a quart "when you can get it." The price depends upon whether the milk comes from the few local cows, or whether it is shipped by air from Seattle at a cost of 30c. a qt. for transportation.

■ **In contrast, milk canned by the International process can be shipped from East Stanwood to Anchorage at ⅙ this cost—approximately 5c. a qt.**

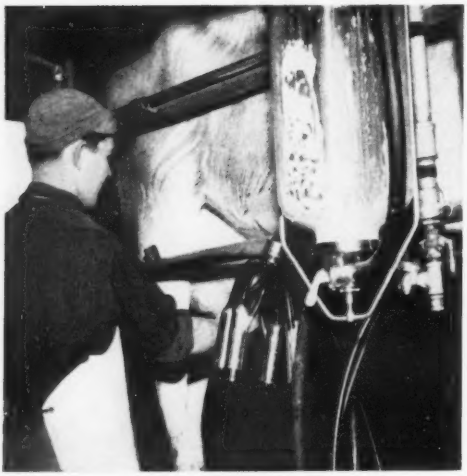
Present output is shipped to Alaska, Japan, and the armed forces.

Technics Pin-Pointed

In the new process, fresh milk is collected under vacuum in 100 and 200-gal. stainless steel farm tanks. These tanks are mounted on 3-wheel dollies for easy handling, since they are trucked directly to the processing plant.

At the plant, the milk is homogenized, sterilized, and cooled without coming in contact with air. While in the closed system, milk is piped to

From "Bossy" to farm tank aseptically . . .



1 COW'S UDDER is washed and dried with paper towel, then teat cups are attached and milk is drawn into weigh-jar (right) for visual examination.

2 TANKS of stainless steel, mounted on dollies for easy transportation to processing plant, receive milk from weigh-jars. Hose (right) connects to vacuum line.

the aseptic canning machine, where it is filled into sterile cans. Sealed with sterile lids, the cans are finally discharged from the machine—sterile whole milk ready for shipment.

The process begins on the farm where under most sanitary conditions, milk is drawn from cows in a milking parlor. These special parlors cost from $1,000 to $2,800 to build. However, the cost will be quickly amortized by the premium—50c. per hundredweight—which the farmers get over the "blended" price at Seattle.

NEW PRODUCT and Man Who Developed It—Dr. R. R. Graves. Shown are cans of sterile milk for shipment.

Under vacuum, the milk is drawn into a 4-gal. glass weigh-jar, where it is checked for color. Next the milk is transferred through rubber tubing and a stainless steel overhead pipe line into one of the tanks in an adjoining room. Vacuum is produced in this tank by the same unit that serves the milking machines.

When all the cows in the herd have been milked, or the tank is filled, the vacuum and milk inlet valves on the tank are closed and the lines removed. The tank is then rolled onto a loading platform, from which it is picked up by a truck for transportation to the processing plant. There are pickups twice daily, seven days a week. The truck holds six 200-gal. and ten 100-gal. tanks. Upon arrival at the plant processing starts immediately.

The plant is a two-level masonry structure. It is now processing 2,000 gal. of milk per day at the rate of 500 gal. per hr. However, present equipment will handle 8,000 gal. per day, and provision has been made for installation of additional equipment that will double this capacity.

Tanks are rolled through a side door of the truck into the plant's upper level. Here, the 200-gal. size is weighed on a platform scale, and the 100-gal. on a 1,000-lb. "live" scale operated in conjunction with a 1-ton hoist. Arms of the hoist fit into openings on the bumper of the tank.

After weighing, the milk is emptied into 250-gal. preheating tanks (there are four). To exclude air, a vacuum is maintained in these tanks. The milk is immediately heated to 120 F. in preparation for homogenization. This heating is accomplished by circulating hot water (from a 400-gal. tank on the lower level) through the tank's jacket.

The heated milk flows under a 6-ft. head through a 1½-in. stainless steel pipe and filter to the homogenizers (each with a capacity of 270-gal.-per-hr.) where it is exposed to 2,000 psi. pressure.

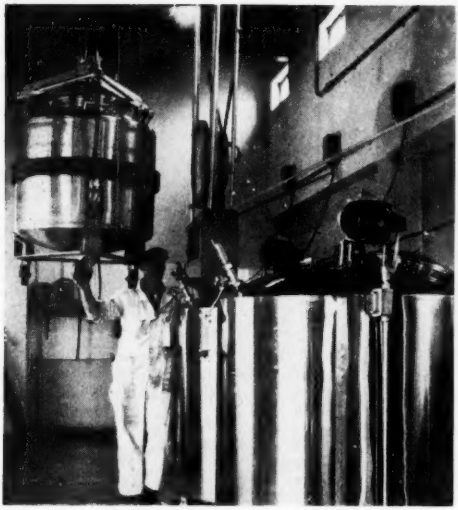
The homogenizers force the milk to two pairs of heat exchangers, newly developed by Dr. Graves. In the first exchangers, temperature is raised to 285 F. in less than 5-sec. as the milk races through ⅜-in. spiral grooves 100 ft. long, under 200 psi. pressure. Heating is produced by steam (at 80 psi.) in chambers in the core and in the outer sleeve.

Milk is pumped through the heater in a relatively thin stream at high velocity, thus does not have an opportunity to burn on the hot surfaces. Furthermore, since the flow is continuously changing directions, the milk is in a constant state of turbulence that further minimizes "burn-on."

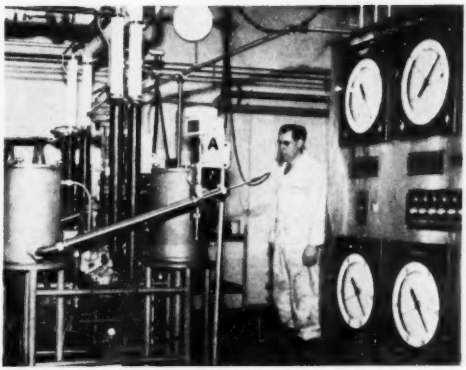
This almost instantaneous heating stops enzymic action and kills all bacteria.

The milk is held at 285 F. for 8 sec. (the time required for it to travel through a 2-in. holding tube 5-ft. long) after which it is quickly cooled to 110 F. in the second pair of heat exchangers (travel here is only 60 ft.). It now enters the Martin aseptic canning

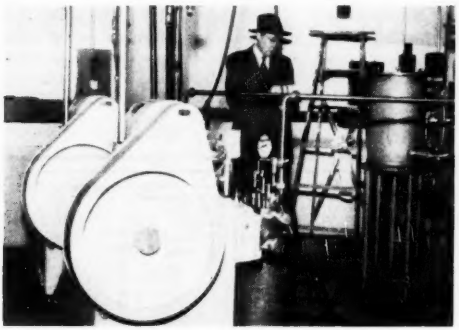
. . . then quickly sterilized and canned



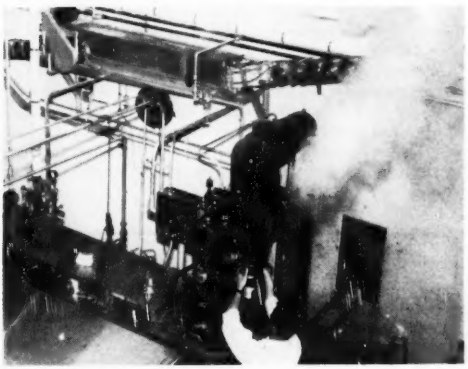
3 AT PROCESSING PLANT tanks are weighed on hoist, then milk is piped into preheaters. Here milk is heated to 120 F. under 24-in. of vacuum.



5 MILK leaves heat exchanger (left) and is held for 8 sec. in 2-in. tube, then enters cooler (center) and is quickly brought down to 110 F. Should temperature of milk in tube fall below 278 F., valve (A) diverts flow away from cooler. Instruments (right) record and control temperatures and pressures employed in the various processing steps.



4 HOMOGENIZERS receive milk from preheaters, expose it to 2,000 psi. pressure, then force it through heat exchanger (right) where it is raised to 285 F. in 5 sec.



6 ASEPTIC FILLING is next. Here, cooled milk is filled into sterile No. 10 cans, sterile lids are seamed on, then cans are discharged for storage or shipment. Note empty cans (top) entering tunnel where jets of air remove any dust. Operator is inserting lids in supply magazine.

machine (p. 71-75, June 1948, and p. 72-74, Feb. 1951 FI) where it is filled into No. 10 cans. These have been lacquered inside in the same manner as beer cans, and the labels have been lithographed directly on the outside.

In the Martin machine, cans are fed into a sterilizing tunnel, where they are subjected to superheated steam at 420 F. By the time they reach the filler head, which is also in the same superheated steam atmosphere, they have been thoroughly sterilized.

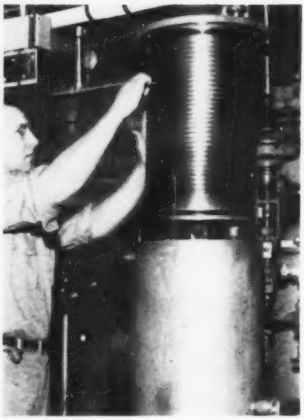
Cans are filled to within 3/8-in. of the top by a continuous envelope-type filler, operating in a chamber that is maintained at 270 F. Lids, meanwhile, have been sterilized in a similar manner, and are now placed on the cans and sealed under 12-in. vacuum. Filled, sealed cans are ejected from the machine, pass under cold water sprays that cool the milk to approximately 65 F., then are weighed, cased six to a carton, and stored at 45 F.

Equipment Sanitizing Stressed

At each farm, all lines are twice rinsed with cold water as soon as milking is completed. A caustic-base washing solution is then circulated for 20 min. and allowed to remain in the lines until the next milking. Before using, the lines are drained and rinsed with 180 F. water. Each farm is equipped with a 120-gal. thermostatically-controlled hot water heater. Farm tanks are washed and steam-sterilized as soon as they are emptied at the processing plant, and kept closed at all times thereafter.

In the plant, sterilization is accomplished, after the usual disassembly, washing, and reassembling, by pumping a cold sterilizing solution through the system all the way to the filling head. This is followed by water, which is brought up to 300 F. both in the heater and also in the cooler unit, where steam is also supplied so that this equipment acts as an auxiliary heater.

When this hot water has been circulated for a sufficient length of time to sterilize the equipment, water is admitted to the cooler unit and milk is started through.



SPECIAL HEAT EXCHANGER that raises temperature of milk from 120 to 285 F. in less than 5 sec. Milk travels through the ⅜-in. spiral grooves (a total of 100 ft.) under pressure of 200 psi. Steam at 80 psi. fills outer sleeve and core of spiral.

admitted to the cooler unit and milk is started through.

To insure complete sterility of the milk, this system is provided with necessary instrumentation, safety interlocks, and alarm signals. They measure the control temperatures, check homogenization pressures, operate 3-way valves, and audibly and visibly signal the operators in case of trouble, giving the exact location of the fault.

Three-way valves are placed at the inlets to the homogenizers so that water can be circulated through the system during initial sterilization. A diversion valve is placed at the outlet of each holding tube to divert the flow of milk from the canning machine in case its temperature should fall below that required for sterilization. These valves are controlled by an electronic resistance thermometer whose temperature-sensitive resistance element is located in the holding tubes immediately upstream from the valves.

The resistance thermometers are conventional electronic safety thermal limit recorders, except that each one also contains an air control unit to regulate the flow of steam to the heater. Therefore, a single instrument and temperature-sensitive bulb perform the two functions of controlling product temperature as well as providing a low-temperature safety limit on the flow diversion valve.

A third 3-way valve is located on the outlet of each cooler. This valve permits water to be circulated through the system to this point.

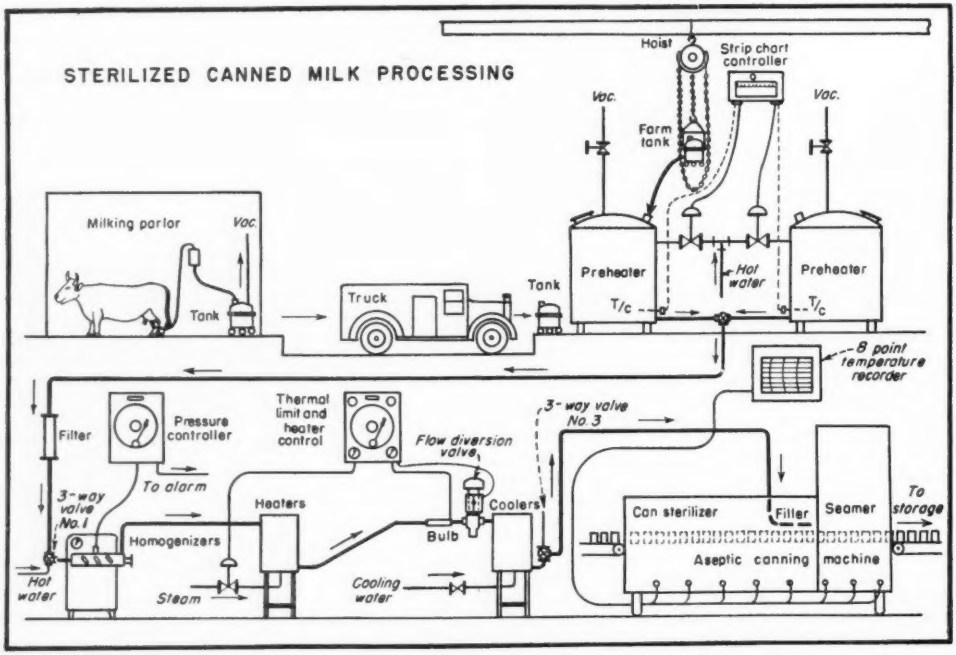
Strain-gage type pressure elements of sanitary construction record homogenizing pressures and provide safety actuation and alarm in event of low pressure, thus permitting the operator to take necessary corrective steps.

To synchronize operation of the system, a signal light on the canning machine panel tells the operator when sterilized milk is coming through the unit. Similarly, a signal is provided whereby this operator can notify the sterilizer operator of a fault in the canning machine. If this fault cannot be cleared within a limited time, the sterilizing system is switched over to water and the milk flow is stopped.

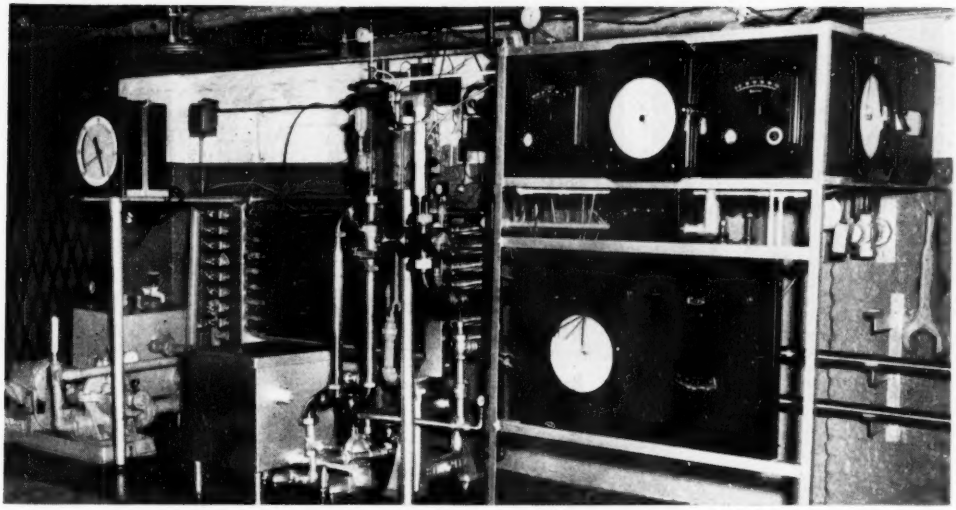
The canning unit is equipped with a safety interlock system to stop the canning process if any of the machine temperatures fall below the sterilizing value. As a further aid to the operator, each of these temperatures is recorded on an 8-point electronic strip-chart potentiometer. The recorder also contains two operation pens: One records when a low temperature exists, the other is energized each time a can goes to the seamer, thus making a record of the machine's production.

Other Controls Employed

Temperature of water used to preheat the milk is regulated by an additional control. In addition, temperature of milk in the preheat tanks is controlled by regulating the flow of hot water to their jackets. For this purpose, thermocouples are mounted in the tanks, and temperatures are recorded and controlled by a single strip-chart electronic potentiometer. Signal lights are also connected to indicate levels of the milk in these tanks at all times.



Check-Ups Here Save Dollars in Plant



IN THIS LAB PASTEURIZER, instruments are given plant-like workout when water is circulated to simulate milk.

Test Units Nip Costly Shutdowns

Troubles vanished at Midwest dairy after all controllers got regular check in special lab pasteurizer and all recorders were "proved" by thermo-gage

W. O. WHITNEY
Special Representative,
The Creamery Package Mfg. Co., Chicago

Many dairymen have run into real difficulty in the maintenance and repair of temperature recorders and controllers. Truth is, too, they've rarely hit on solutions that can be termed entirely satisfactory.

However, one large company—Bowman Dairy Co. of Chicago—has. And with five very notable benefits.

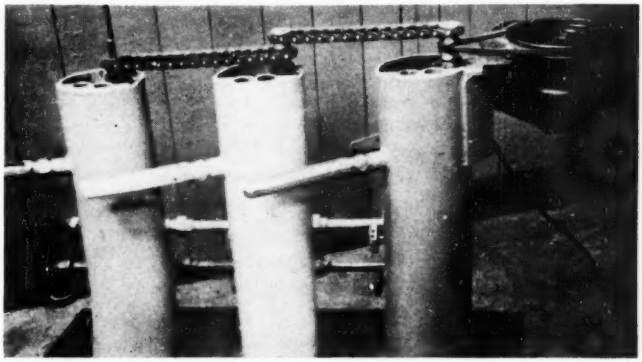
- **Less lost time in plants**
- **Better operation**
- **Fewer trouble calls**
- **Quicker repairs, and**
- **Increased life of instruments.**

Now for the story: Bowman Dairy Co. has four large milk processing plants in the Chicago area. And each plant has one or more high-temperature short-time pasteurizing units as well as recorders on several other pieces of equipment. These instruments must be kept in efficient and accurate working condition. Any that act erratically, or are damaged or broken, must be repaired or replaced at once—to avoid shutdown.

Prior to the war, Bowman sent two men from its engineering department to an instrument company training school. There, they were taught the principles of operation, various applications, how to dismantle and reassemble, and how to repair the types of instruments the dairy uses. Maintenance, including cleaning, was also carefully covered.

When these men returned, they recommended the establishment of a testing and repair laboratory. But due to the war and additional work, this had to be put aside.

(*Turn to page* 154)



ACCURACY of recorders at three significant temperatures is checked by inserting bulbs in holes in top of cylinders that comprise this unit. Thermometers extending from sides of each cylinder indicate temperature of water inside. Motor (right) drives agitators that keep water uniformly mixed.

Multi-purpose detergents

Breakpoint chlorination

High-pressure cleaners

Selling Management

Here Are the Cogent Factors and

Benefits are reduced labor and costs, improved quality,

C. W. GRIFFIN, JR.
Vice President,
California Packing Corp., San Francisco

One of the first steps in selling anything—whether it be a product or a service—is a careful analysis of what you are selling.

Called for, too, is an analysis of the prospect to whom you are selling it. Find out all you can about his needs and problems. Then figure out how your product or service can help him to meet those needs or solve his problems. ■ **When you apply these fundamental sales principles to the problem of selling sanitation to food plant owners, the results of your study will bring forth very enlightening sales points.**

Intention here is to spotlight these forceful factors for all those associated with food plants, but particularly for those directly active in the sanitation functions.

At the outset, all evidence will show that the food plant not having a sanitarian, or a sanitation program, has a *need for* a sanitarian to solve plant sanitation *problems*. This prima facie evidence becomes obvious when you consider that—

1. *Sanitation does improve quality in a food product.* Some may argue that a perfectly clean product can't be made cleaner—which is true. But, products processed under the very best and most efficient sanitary methods are more appetizing and appealing in color, texture and flavor than those produced under older and less efficient methods. Quality standards are never static—they are continually improving. And this progress demands a higher degree of all technical controls.

2. *The entire food industry is faced with a choice between self-regulation and regulation by some kind of government body.* A food plant must be operated in such a way that its sanitation is above serious criticism. Otherwise, its owners must be prepared to accept whatever consequence some regulatory body might see fit to impose upon them.

Positive Action Needed

Any measure of sanitation achieved through inspection by regulatory agencies would be costly, would be inefficient as gaged by the high standard of private industry, and in some plants would never achieve a truly satisfactory level of sanitation. A progressive sanitation program can only be achieved by positive action on the part of private management.

In its supervision of the food industry, the Food & Drug Administration—a very potent and exacting regulatory body—plays no favorities. It has done incalculable good. As a protective agency against the occasional unscrupulous or careless operator, it has served the American public well. And, human nature being what it is, there is no doubt but that we will never dispense with the F&DA.

However, even the most conscientious food processors have encountered problems with this agency.

Getting Interpretations Straight

Generally when this occurs, the trouble lies chiefly in effecting a complete meeting of minds. No matter how carefully the rules and regulations promulgated by the F&DA are studied, most of us are never entirely certain of the interpretation.

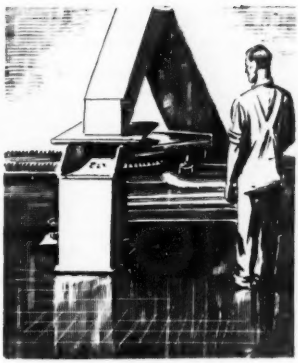
This is where the trained sanitarian, devoting full time to his one job, can be of tremendous help to management. It is one of his major duties to maintain close contact with F&DA officials, and those of other regulatory agencies, in order to keep fully informed on their research, and to familiarize himself with their thinking and viewpoints. The sanitarian is then in a position to tell management exactly what is expected of it.

Upon advice from the sanitarian, no

TO SANITATION SAVINGS

Power scrubbers

Motorized sweepers



Latest sanitary equipment

On Plant Sanitation

How to Marshall Them for Action

and practical protection of plant, product, and company

experienced management is going to risk seizure or condemnation of the company product, or any part of it, through willful failure to meet all clearly defined sanitary requirements.

The cost of just one such seizure, in actual loss of products, and the even greater loss of public confidence, could pay the cost of a sound sanitation program for a considerable period of time. Anyone having trouble selling management on a sanitation program might well consider mentioning the ever-present potential of adverse F&DA action.

Of course, it's up to the sanitarian to demonstrate how his services can help to minimize this hazard.

The Risk of Harmful Publicity

While the F&DA is a strict, but on the whole fair, taskmaster, there are other, unofficial agencies which are always ready to criticize harshly and without warning, and which are seldom amenable to what most people would consider reason. These are the various groups typified by some "consumer research" publications and kindred organizations—the self appointed critics and castigators of American industry.

There is little information or evidence concerning how these groups operate or how thorough their purported investigations may be. And, there is always a hazard—particularly to a food manufacturer—of being confronted with scathing criticism, in print, about his products. The implication of such undesirable publicity is usually that the manufacturer has been something less than considerate of the public welfare in his manufacturing methods. In view of the number of adherents claimed by organizations of this kind, such attacks are not to be taken lightly.

Value of Competent Department

Of course, there is no guarantee that the most efficient sanitation department in the world can wholly protect a processor against attacks of this nature. Certainly, such a department cannot do so unless the sampling methods generally employed by these organizations are more comprehensive than we are led to believe. But the fact remains that a well-run, thoroughgoing sanitation department is beyond a doubt the best insurance a food processor has against the occasional "off-color" product which can be the cause of so much and such costly grief.

It should be emphasized that time will not bring any cessation or even diminution of these activities—either the governmental kind or the far more capricious and sometimes vicious non-official kind.

Quite the contrary, in fact.

Official sanitary regulations are becoming more exacting and more sweeping in their scope each year. This not only applies to F&DA, but also to various local and state regulatory bodies. In the purely negative role of protecting his company against unfavorable action by any of these numerous agencies, a competent sanitarian, at the head of a well-organized sanitation department, can render valuable service.

Super Has Enough to Do

No matter how conscientious a plant superintendent may be, or how able he is as an operating man, he simply does not have the time nor the facilities for keeping up with the latest developments in the field of sanitation. Of course, most plant superintendents can figure out the progress made in this important phase of food processing—in time. But, that time might be long delayed. For the superintendent has his supervisorial duties that require all of his attention, every day.

Management is always acutely con-

Finding It Tough to Sell *Your* Top Men?

"I was amazed," says Author Griffin, "when I first discovered there were top managements that had to be *sold* on a sanitation program.

"What started me looking into the matter was a question I put to industry people: 'Do you think that selling sanitation to a food plant owner is really a *hard* job?' I was startled by the replies: 'Harder than you think—a lot harder!'

"Frankly, when I hear a man talk about 'selling' something to someone, it suggests *sales resistance* to me. And immediately I think this man must feel a lot of *sales effort* is needed to put his idea over. But in the case of sanitation, this just didn't make sense to me. In fact I found it inconceivable.

"Yet from what I'm told—and by men whose truthfulness I don't question—it is all too true that there are food plant owners who have to be 'sold' on plant sanitation."

Mr. Griffin's thoroughness in "looking into the matter" is revealed in this article. He details a singularly effective presentation aimed at convincing management on the question of sanitation. And he punctuates it with practical tips that will be of help to all—and of special value to those who are finding it tough to win over their top men.

scious of costs. Any time you can show the owners or managers of a business a way to cut expenses without in any way impairing output or jeopardizing quality, you're pretty sure to get a hearing. When you are able to actually show them that reduced costs can go hand-in-hand with better products—you're practically "in."

Pointing Out the Economies

The following paragraphs illustrate six ways to effect savings:

1. Many food firms now rely in a large part upon commercial cleansers in their plants. There is no specified "clearing house" to advise plant men as to the best detergents for the various jobs. They must depend, more or less, on their own resources to decide which ones are best.

The fact is that extensive plant study and basic laboratory analyses are required to develop detailed specifications to which these detergents must adhere. In some instances one formulation will take the place of three or four previously used.

This standardization: (a) takes the random experimentation and guessing out of selecting the proper material, (b) simplifies cleaning operations by minimizing the number of compounds used in the plant, and (c) can cut the annual cost of these compounds almost in half.

2. Breakpoint chlorination is the best way to maintain cleaner plants by preventing development of slime and bacterial growth on equipment. And it eliminates undesirable odors. Particularly, it will prevent slime and off-odors in the hard-to-get-at places in equipment.

In the limited time available for plant cleaning (with 2-shift operations), this system saves man-hours and detergents. The cost savings are evident.

3. High-pressure cleaning systems, utilizing steam and cold water and producing large volumes of a hot detergent solution under pressure, should be placed in a central location from which the solution may be piped anywhere in the plant.

The old method of hand scrubbing belts, canning tables, conveyors, and supporting framework, with hot water and a detergent solution was a slow and expensive operation. Hydro-type guns were relatively ineffectual in removing slime and organic-matter buildup. The new type system will keep plants more sanitary in the limited time available for cleaning in 2-shift operations.

At the end of the operating season, rubber belts used to be cleaned by taking off the guides and then laying the belts on the floor and scrubbing them with an abrasive detergent. These belts now may be left running in position and cleaned while the rest of the equipment is being cleaned—a much easier and less time-consuming method. In this one cleaning operation, the savings will more than pay for one of the units.

4. A pair of small power scrubbers and a "wet" pick-up vacuum cleaner can do wonders. One plant purchased such equipment at a cost of approximately $1,000 and proceeded to cut mopping and squeegeeing costs by at least $2,000 a year. In this instance, it was expected that it would take the operators at least two to three months to become really efficient with the machine. However, a time study showed that within a week the men were cleaning four to five times the area previously covered by hand mopping. And not only that: Within a month's time, the floors were much cleaner than they ever had been before, and because they were cleaner they were also safer to walk on.

5. "Dry" pick up vacuum cleaners with proper attachments and also power sweepers have considerably reduced cost of dust removal in plants and warehouses. Ordinarily, dust accumulations are removed from overhead rafters by first sweeping them, then cleaning the floor. The vacuum cleaner does this job better, quicker and at a materially reduced cost. Warehouse floors that were formerly swept by hand are now cleaned with a power sweeper. And the saving in labor should pay for the sweeper in less than a year.

6. Strides can be made with use of the latest sanitary equipment. It is fundamentally spic and span, also easier cleaned. For instance, some plants are experimenting with a somewhat revolutionary substitute for conventional bucket-type elevators to move products (such as dried fruit) from one level to another. This is a belt that is closed by a zipper after the product has been placed on it, then later is opened again at the transfer point. By placing water sprays and squeegees on the belt, it is literally self-cleansing. Any additional cleaning that may be required involves a minimum expenditure of time because the system is manifestly more accessible and has fewer hidden crevices and surfaces in which fruit particles can lodge.

Sum It Up—Drive It Home!

Taken all-together, the foregoing points should add up to a very potent and cogent sales presentation. Each one is of significant importance to top management: Reduced costs, improved quality, the best available ways to avoid F&DA action and seizures, and protection against sniping by consumer research publications. And these all in face of the probability of more and increasingly strict regulations.

If you really need more sales ammunition, use the appeal of pride in the product—always a sure-fire approach to top management. Add, too, that sanitation and sanitary methods are getting more and more attention in the food industry press. And if the prospect isn't "sanitation conscious" by the time you've gone this far, then he is out of step with the times.

Now, you've told the prospect that sanitation in food packing operations is getting more and more of a going-over by our governmental agencies as time goes on. Smash this point home by reiterating, in a more forceful manner, that each year sees further tightening of food standards. Remind him of the ever present threat of plant closure due to seizure of some product. If he isn't in an apprehensive sweat by then, he just hasn't had much experience with our regulatory bodies. And if you call this the "scare-approach", remember that it is the fear of what *may happen if* that serves as the strongest force for righteousness.

In making your presentation to the prospect, don't do it by means of

intricate charts, graphs or tabulated figures. Granted, they always look impressive. However, treasurers and comptrollers are usually the only executives who really get steamed-up over them.

Describe Operations

Following your sales presentation, give your prospect a general idea of how a sanitation department is set up and how it operates.

You have established the fact that good sanitation is absolutely essential to a quality product. Since the production of such a product is a basic management function, it then becomes axiomatic that sanitation deserves the consideration of top management. It is, therefore, good business to assign responsibility for this phase of food processing to an organized department—just as is done with accounting, legal, purchasing, shipping, and other management functions.

Being a management function (an essential part of management's obligation to the consuming public), this department should be represented at the management level. It is only in this way that the sanitation program can be carried on efficiently and effectively, and properly coordinated with the rest of a company's operations. Much depends upon the emphasis and backing —both moral and financial—accorded it by top management. It is only this kind of cooperative support from the top echelon in the company that will strengthen such a program and make it successful.

Top management should receive regular reports from the sanitarian. These reports should be made in person so questions may be asked and answered as they arise. Also, the sanitarian should make every effort to interest his superior in getting off his swivel-chair occasionally and taking a first-hand look in the plants. This may be a hard idea to sell. But it certainly pays off in added interest and intelligent consideration of the sanitarian's problems and suggestions.

To keep abreast of advances made in this rapidly changing phase of food processing, the sanitarian should attend conferences and even classes devoted to sanitation work. Sanitation is a profession. And just as members of other professions attend conventions and schools, so should sanitarians be encouraged to keep up-to-date on practices.

You Must Have Cooperation

As a final word of caution, it will be best for you to admit that your selling job is just begun after you sell your program to management. One of the most important duties of a sanitarian is his plant inspections. These must be made at regular intervals. They should not be made by the sanitarian alone; that would make him a "snooper." Instead, they should be made in company with the plant superintendent or his man in charge of the plant sanitation work.

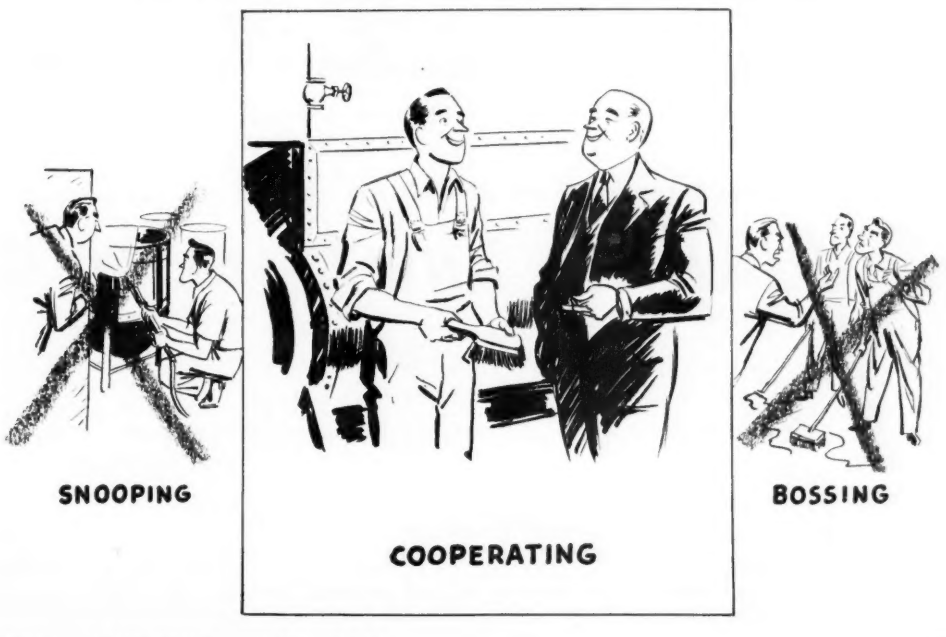
These men may then discuss how efficiently and effectively the program is working. And, when a written report is made to top management, with a copy of it directed to the plant superintendent, the sanitarian will know in advance what is contains.

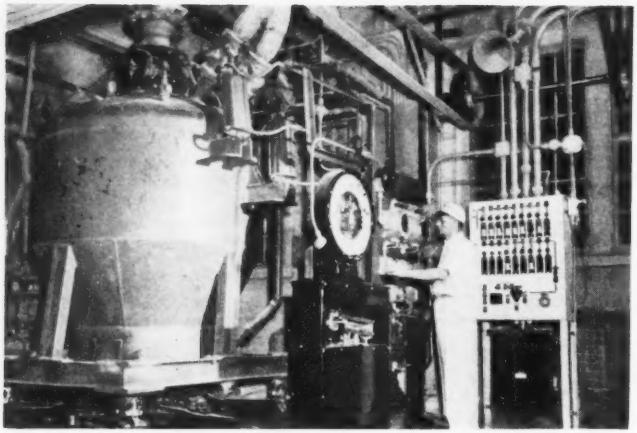
The sanitarian must have the cooperation of supervisory personnel. He should convince them he is there to help them—not to snoop. By cooperatively suggesting ways to cut sanitation costs and at the same time do a more thorough job, he will develop the goodwill of his co-workers.

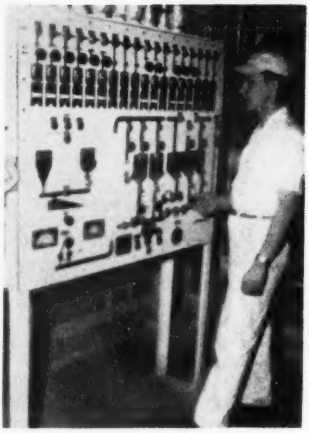
Above all, do not adopt a bossy "do it or else" attitude in dealings with plant personnel. Anyone following this method will quickly ruin his chances of reaching the goal. Make them feel that the suggested improvements or changes will result in a more efficient operation. Suggest and sell your wishes—but never dictate. Remember the old adage, "You can drive a horse to water, but you can't make him drink."

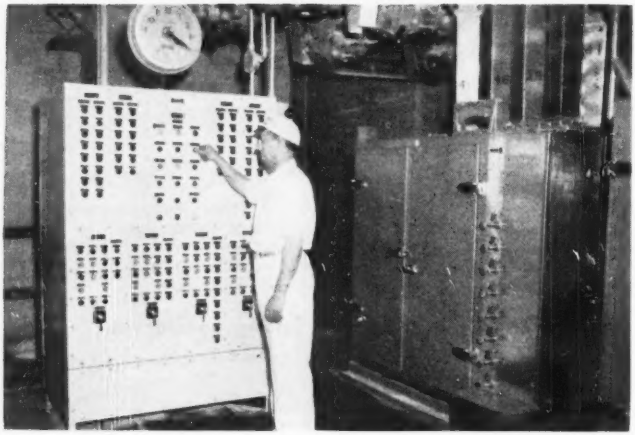
The above article comprises the talk delivered by the author to the 1950 Annual Conference of the Association of Food Industry Sanitarians.

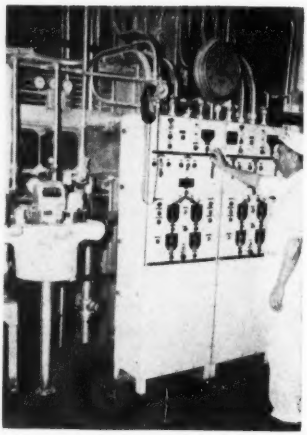
Proper Approach Is the Fundamental Key In Selling Sanitation











4 MAIN PANELS. Upper left: Flour movement is automatically controlled from this board. Upper right: Non-flour solids ingredients are handled from here. Above left: Formulation panel. Above right: Mixing panel.

Electronic system turns out food product in

QUANTITY *AND* QUALITY

Four graphic control panels key Pillsbury's large-scale output of prepared baking mixes—and but 12 men run plant . . . Result is superior product meeting the company's high formula standards

LLOYD E. SLATER
Assistant Editor, "Food Engineering"

A "modern engineering baker's dozen" is the way you might describe the small team of twelve men operating Pillsbury's "million dollar" prepared mix plant at Springfield, Ill.

Comprising the total personnel of this large facility, just four supervisory technicians and eight auxiliary helpers "handle" a huge daily job: They move tons of several ingredients. Blend them with a precision that must be subsequently reflected in the quality of a 1-lb. cake. Pack the product into thousands of 100-lb. sacks.

It's all done the advanced-engineer-

ing way—with panels and pushbuttons. For this plant reputedly is the most completely automatic operation of its type, employing a practical combination of electronics with materials handling, "mechanical brain" style. And the result matches the principle—a quality food mass produced.

The new operation's many food engineering innovations add up to the following gains:

- **Ingredient costs decreased.**
- **Sanitation simplified.**
- **Formulation error-freed.**
- **Infestation chances curbed.**
- **Manpower costs minimized.**
- **And . . . assured product quality.**

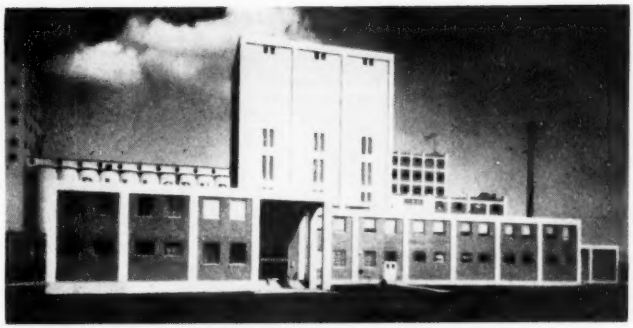
Before describing how these gains are effected, a word or two about the structure housing this pushbutton process:

Of modern functional design, the building has a two-story portion, 180 x 300 ft., and a central tower 110 ft. high. Most of the processing takes place in the tower—which is constructed of tile, red brick, and glass brick to minimize atmospheric effects. Warehousing, shipping, receiving, and mechanical departments are spread throughout the first floor of the building.

Second floor of the structure is occupied by offices, control laboratories, and experimental baking kitchens. This space is air-conditioned. The processing area also is constantly kept, under separate thermostatic control, at a temperature above 80 deg. F. Open-grated steel flooring between levels in the tower helps to assure this conditioning.

Ingredients Come in Bulk

Operations and layout are best described by following each ingredient into the process. Five groupings of ingredients are mass-maneuvered into Pillsbury's prepared mix line—flour, sugar, other premixed dry ingredients, liquid shortening, and liquid flavoring. The first two named are moved by Fuller Airveyors before mixing, the latter two handled by pumps and piping.



CENTRAL PROCESSING tower dominates new prepared mix plant. Mill (in background left) supplies flour through air conveying system.

Flour comes from the adjoining 1,600,000-lb. mill through a 700-ft. air conveyor that deposits it in ingredient storage bins on the top level of the tower. Both hard wheat and soft wheat flour are handled in this manner. These bins in the prepared mix plant are remotely surveyed from a control panel in the flour mill, the readings indicating bins available for filling and position of valves on feed lines.

Supplying of flour is completely automatic. When the control panel indicates a bin is empty, the operator merely pushes a momentary contact button and an air cylinder-driven valve to the air-conveyor system opens. This starts the feeding of flour to the system. When full, a high level Bindicator shuts down the feed automatically and the line valve closes.

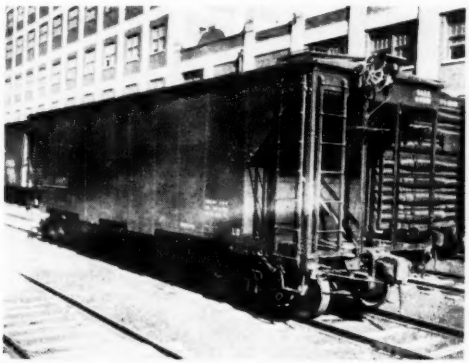
For accounting purposes, all flour from the mill going to the prepared mix plant passes over a 5,000-lb. weigh scale.

Sugar for the process arrives in a specially-designed, 100,000 lb.-capacity bulk-sugar car that is leased by the company. Unloading is into spouts directly under the car as it stands at the plant siding. Each spout leads to a subterranean sugar-unloading pit, where a surge bin delivers 175 lb. of sugar per minute to an air-conveying system. The latter takes the granulated product to storage bins of 500,000 lb. capacity.

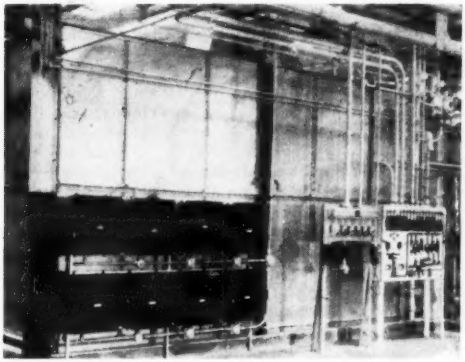
The only manpower needed for sugar unloading is that required to hook up the telescopic connections between bulk car and surge bin in the sugar vault. Total discharge of the car is accomplished in 8 hr. And the air conveying system shoots the load to storage automatically—with indicating lights following the sugar's route and showing the condition of each bin.

Sugar is removed from storage, as needed by the process, via a screw conveyor, which delivers it to a sifter and

From Bulk-Sugar Car to Bins

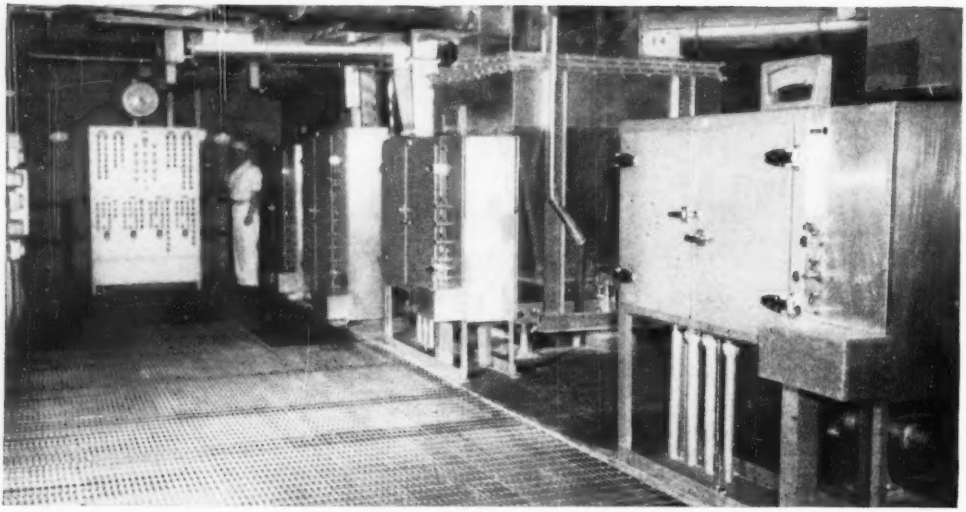


SPECIAL SUGAR CAR is leased by company. It has bottom unloading spouts for efficient bulk-handling procedure.

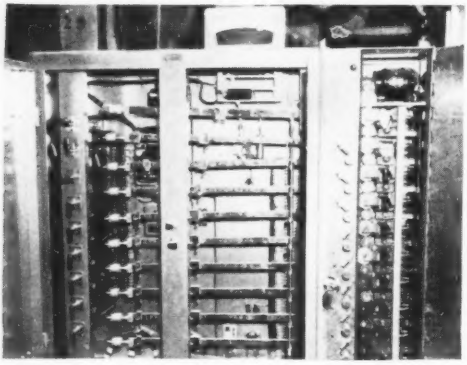


STORAGE BINS will hold 500,000 lb. of granulated sugar. Air conveyor in-feed panel is seen at right.

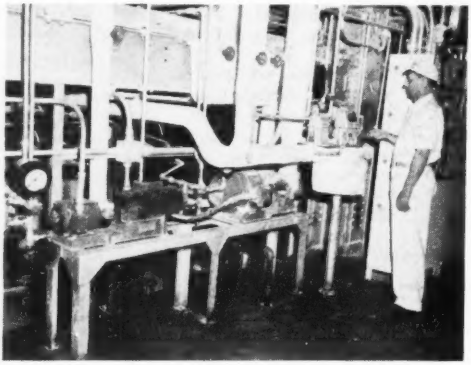
Weighing and Metering Ingredients



FOUR SCALES (right) are used for weighing of ingredients. They are completely controlled from panel seen in rear.



BEAMS, revealed here inside one of scales, set exact weight of dry ingredients that go into formula.



FLOW METER controller operates an automatic valve to deliver correct amount of liquid shortening.

pulverizer. Storage bins then house pulverized sugar until it is automatically removed, air-activated, and air-conveyed to the ingredient storage bins.

Other Dry Ingredients

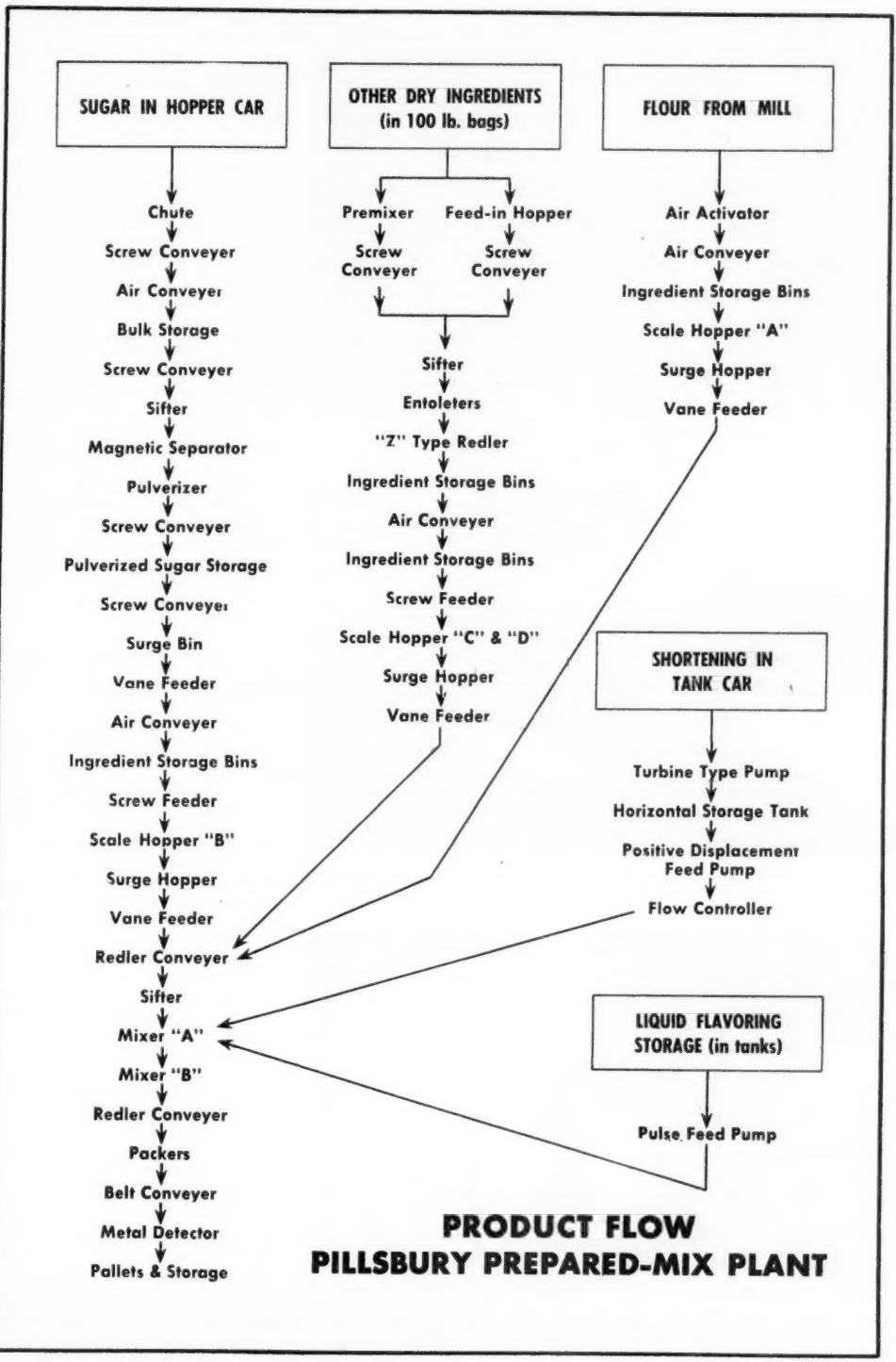
All minor dry ingredients—salt, powdered milk, cocoa powder, leavening, eggs, etc.—are received in railroad car lots in 100 lb. multiwall paper bags. Unbagging and feeding to the process occurs on the first floor of the plant.

Ingredients that require premixing prior to air conveying pass through a 2,000 lb. mixer. Other dry ingredients are loaded into a dust-hooded feed-in hopper. Both mixer and hopper discharge through pneumatically operated gates onto a conveyor delivering to a 500 lb./min. sifter. The flow of dry ingredients is then split by an equalizer gate valve to send identical product streams to two 250-lb.-per-min. Entoleters, where possible infestations are destroyed and complete blending occurs.

From the Entoleters, a "Z" type Redler conveyor elevates the dry ingredient mixture into two storage bins equipped with air-operated discharge gates. When the process demands more ingredients in the ingredient storage tanks, these gates are driven open and the product discharges into a Fuller system for air conveying to the top of the building.

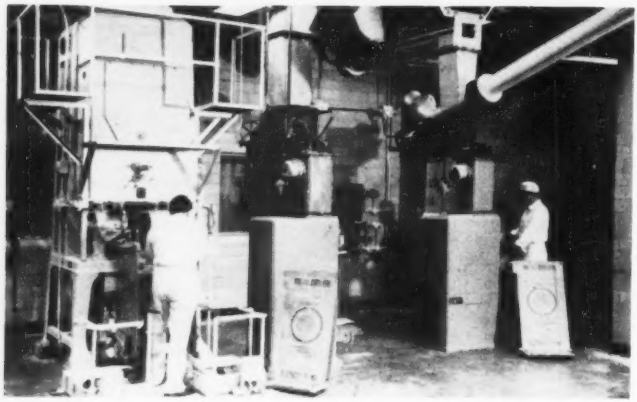
Nerve center in directing the flow of minor ingredients is the feed-in area control panel. Here is graphically outlined (in black miniature on a white panel surface) each unit of processing, moving, and storage equipment in the feed-in area. On this panel there are also reproductions of the ingredient storage tanks topside that store the ingredients, with lights indicating the supply available in each tank.

Thus, one man can direct all automatic operations in the area—with auxiliary help required only to empty sacks into the feed-in hopper and mixer. When storage of ingredients topside becomes low, he is advised by warning lights. By means of associated pushbuttons, and watching the lights, he then supplies the needed ingredients, sending them aloft through the air conveying system.

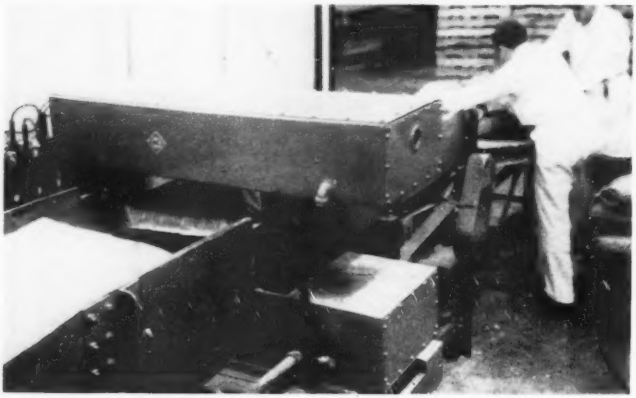


PRODUCT FLOW
PILLSBURY PREPARED-MIX PLANT

Packing, Inspecting, Storing



FINISHED product is packed in 25- and 100-lb. multi-wall paper bags by these automatic machines. Unit (left) fills six large bags a minute.



ELECTRONIC detector is safeguard on bagged-goods. It will "spot" any tramp metal in bag, then stop conveyor and sound an alarm.

LIFT TRUCK AND PALLETS are employed for movement of finished, inspected products. Bag flattener is used to improve stacking.

Handling of liquid ingredients for the process is, of necessity, quite different from that of the dry components.

Shortening is supplied to the plant in 80,000 lb. capacity tank cars. These unload through turbine type pumps in slightly more than an hour. Shortening is then stored in 10,000-gal. horizontal cylindrical storage tanks equipped with automatically controlled unit-heating systems. Recirculating pumps keep a constant flow of this ingredient going to the mixing area, where a flow-metered by-pass line delivers shortening when called for.

Liquid flavoring is stored in small-capacity stainless steel vats and is sent to the process through Pulsafeeder pumps. These will furnish a fixed quantity of flavoring during specified time periods.

Formulation and Weighing

As the preceding description of dry ingredient flow has shown, all solid components of the prepared mix finally locate in ingredient storage tanks on the top floor of the plant. These cylindrical vertical bins (there are 46 of them) are of varying capacities and are made of galvanized iron or stainless steel, according to the ingredient handled.

Each bin is equipped with airpower-operated cylinder valves on feed-in and discharge lines, as well as level indicating devices.

The ingredient storage bins are arranged in four groups to supply four weigh-scale hoppers on the floor below. Each hopper is associated with a multi-beam scale to allow the addition of varying ingredient weights in accordance with the formula being run. Thus, the complete formulation and weighing operation is accomplished through the action of 25 beams in four scales. The weight of various ingredient batches going into the mix is set by positions of "riders" on beams.

The four scales handling dry ingredients are designated "A," "B," "C," and "D". Scale "A," with three beams and having a capacity of 3,000 lb., usually handles flour stored in bins No. 1 to 11. Scale "B," having five beams and also handling 3,000 lb., takes care of the pulverized sugar used in the mix. However, bins No. 13 through 23, supplying "B" scale, can also store flour as well as sugar and direct it to this scale hopper.

Scale "C," with a 600 lb. capacity and nine beams, cares for the other dry ingredients. These are fed from bins No. 25 to 35. Scale "D" is set up to handle ingredients through hand-fed hoppers, should air conveyors be shut down or normal feeding opera-

(*Turn to page* 185)

HANGING 24-ft. high, sausages are dried by regulated air fed from ducts placed at various levels from floor to ceiling.

Old Recipes *plus* New Tools

Equal Top-Quality Meat Delicacies

Armour's dry sausage department in South St. Paul shows how latest meat handling and processing technics can match "old world" products

TRADITION and ancient recipes go into the manufacture of dry-sausage. And Armour and Company's new department at South St. Paul—carrying out one of the largest and most efficient dry sausage operations in the country—relies upon them. plus the practical adaption of engineering technics usually associated with other food products.

It might seem that the extreme care and constant inspection so vital to true-type dry sausage would belie the use of bulk handling efficiencies and large, economical processing equipment. Yet Armour engineers find their modern methods ideally suited to this ancient process.

■ **By cutting down product transfer time with the latest in conveying systems and eliminating drying variables with automatic controls, a complete line of dry sausage is being mass produced that retains all the appeal and delicate flavor of "old country" prototypes.**

Let's see why these new tools so readily apply to an old process:

First of all, a unique bucket conveyor system is used to deliver the meat and trimmings. This eliminates a three-time transfer of product between hand-pushed trucks and the grinders. By thus reducing handling, greater sanitation is afforded, with no chance of foreign materials getting in to upset the fixed and delicate formula of the product.

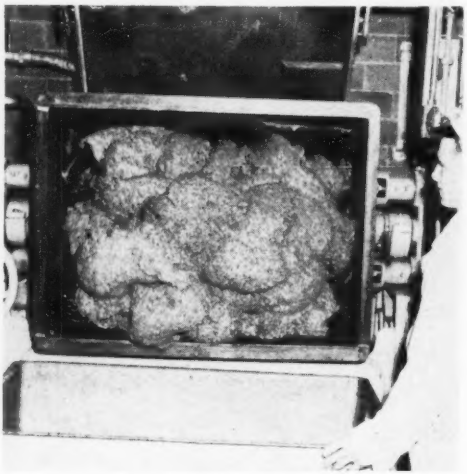
Then, after stuffing, the dry sausages are sped through each stage of the process by an overhead rail conveyor system. This permits fast, clean and safe product movement. Abnormal lingering between points in the process can mean undesirable wrinkling and color changes.

Thus, modern materials handling is able to offset the time lags which can hurt a distinctive item when it is mass-produced.

Another technical achievement is the use of automatically controlled space conditioning in the drying operation. Sausage makers readily agree that this is the most vital point in the process. Careful attention throughout drying has always been necessary for optimum color, flavor and general appearance.

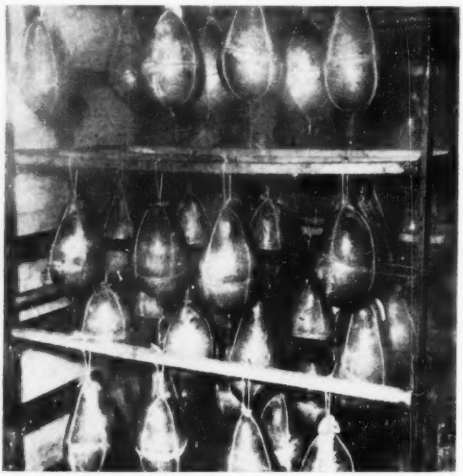
The new dry sausage department uses versatile instrumentation to enforce the time-honored drying schedule originated by skilled European sausage makers. Temperature and humidity of each holding room are recorded and controlled at fixed values set up for the particular product. In addition, in

1 **SPICES** going into various types of dry sausage are carefully measured in aromatic spice room.



2 **MIXING** of the spices and the meat in this stainless steel unit precedes transfer to the curing room.

5 **SMOKING** room temperature is highly important and is carefully logged through stem thermometer.



6 **WASHING** mortadella sausage follows smoking and is done by a steaming hot spray showered upon meat.

order to insure uniform drying in the unusually tall rooms (24 ft.), the regulated air is fed from a series of ducts running at various levels from floor to ceiling. This eliminates the old practice of having to reverse the position of top and lower level sausage during drying.

Not so long ago most of the 40-odd varieties of dry sausage had a relatively small market among the immigrant population. This brings one to ask what has justified the establishment of large-scale, well-engineered facilities for quantity production?

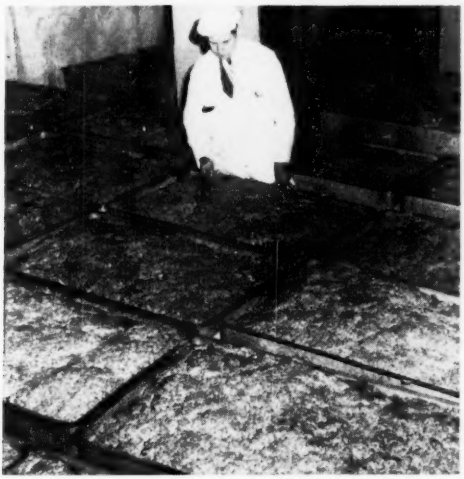
Armour recognized the possibilities of this picturesque line by setting-up a special dry sausage sales department and promoting the product extensively in its nation-wide organization. Aided by 30 specialty salesmen, branch house and plant salesmen now sell direct to dealers. This has placed dry sausage on practically every meat counter. Its natural appeal, coupled with an inquisitive and developing American palate, has demanded growth of production facilities.

In addition, and further sparking the increased demand, dry sausage has naturally fit into the trend toward self-service meat retailing. Individual consumer-size units of Cervelat, Thuringer and Cooked Salami show growing sales. And a new line of single-sliced vacuum-packed cold cuts, including Cooked Salami and Thuringer, has successfully passed its intial marketing test.

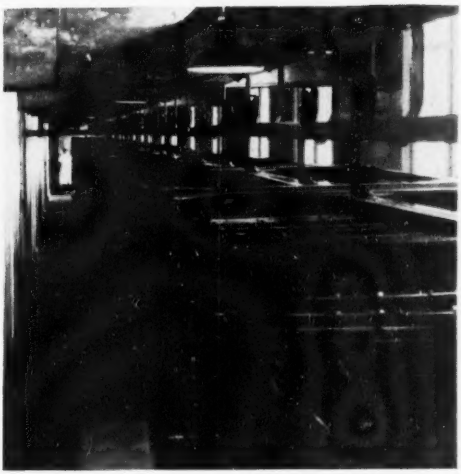
The success story of this tradition-steeped food line can serve as a splendid example to other expansion-minded processors with specialty or unusual items of equal potentialities.

Much of the appeal of dry sausage

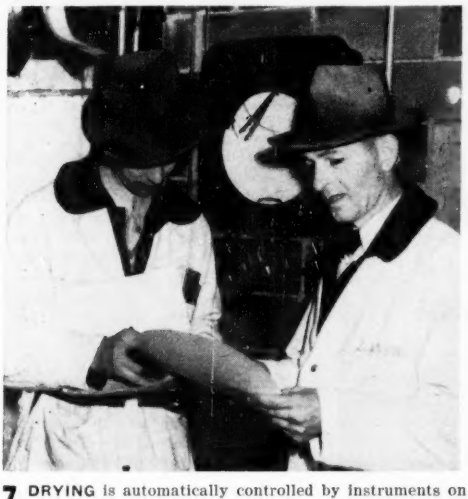
But Methods Are Adapted to Up-to-Now Engineering



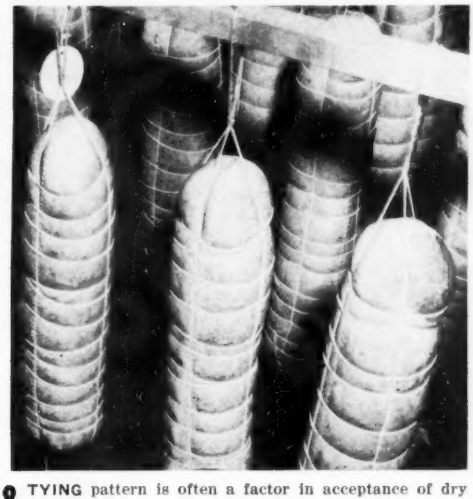
3 **CURING** is done in refrigerated room using stainless carts. Temperature is checked frequently.



4 **AFTER STUFFING,** meat is conveyed (above) to holding room by means of an overhead rail system.



7 **DRYING** is automatically controlled by instruments on wall. Temp and humidity charts are checked daily.



8 **TYING** pattern is often a factor in acceptance of dry sausage. Here's a close-up of Genoa salami.

lies in careful retention of the traditional flavor and appearance of old world varieties. Because of this, each type receives much individual attention during the process—carried out even to the point of following the age-old and distinctive method of tying the sausage. Among Europeans, and also a fast developing group of American connoiseurs, the wrapping of the twine—its looping and number of longitudinal strands—can actually affect sales.

Here is a list of some of the South St. Paul plant's lesser-known and more exotic sausages, that are rapidly coming into favor:

Genoa Salami—made with finely chopped pork, with aged wine flavor, named after the Italian seaport.

Goteborg—made of beef and pork heavily smoked to suit Scandanavian palates, named after the Swedish town.

Mortadella—contains pork and beef, weighs 5-7 lb., and is "shaped like a punching bag."

Frizzes—a French sausage containing pork and beef, weighing about 1 lb.

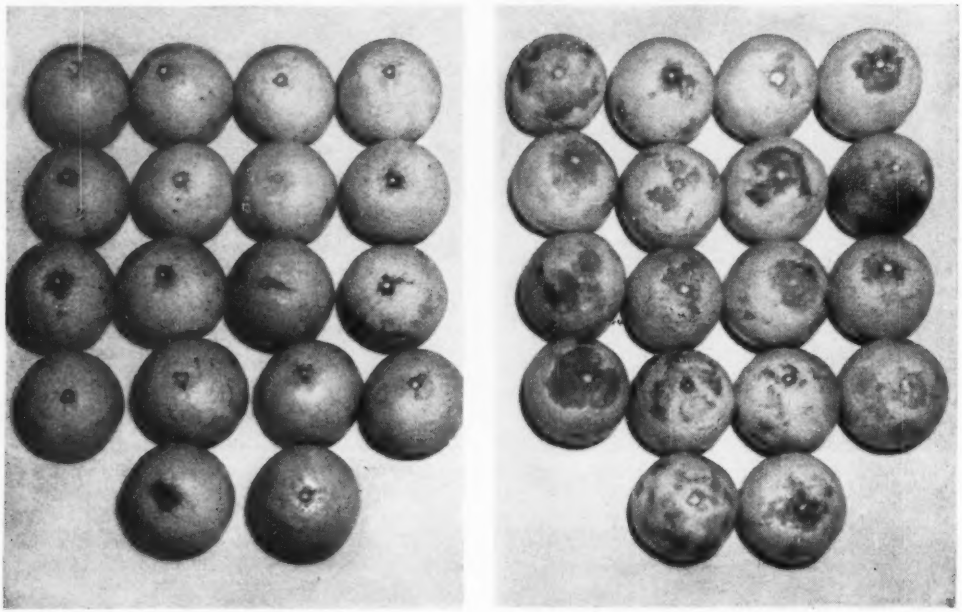
Chorizos—lightly smoked 4-in. Spanish link sausage, seasoned with paprika and sweet red pepper.

Capacola—solid piece of pork shoulder meat which is covered with red pepper paste before stuffing into casing.

Proscuitti—specially cured and treated hams, pressed into a distinctive flat shape.

The production of the dry sausage—said to be among the world's first processed foods—is carried on in clean, tiled surroundings with the latest in conveying, instrumentation, and stainless steel equipment.

Gas Keeps Them Good ↓ Stops These Losses ↓



ORANGES (left) were inoculated with stem-end and blue mold decay then processed with special liquefied gas. After 17 days all were sound. But all fruit at right, similarly inoculated but untreated, showed signs of rot after like period.

New Treatment Ups Fruit Life

Special gas process enables shipment of citrus fruits, strawberries, also tomatoes for long distances without refrigeration. Improves color, too

C. E. WRIGHT
"Food Engineering" Correspondent

Experiments and tests, conducted over a period of years by the Skinner Machinery Co. Division of Clinton Foods, Inc., Dunedin, Fla., have resulted in development and successful use of a liquefied gas for de-greening fresh fruits and vegetables and for preventing or arresting decay in shipping.

During the past year, this process has been tried out on several hundred regular commercial shipments with such good effect that the experimental stage may be said to have been passed.

The treatment was first applied in the Florida citrus field. Recently, however, it has been used on shipments of peaches, strawberries and tomatoes.

■ **Checks on a large number of these shipments indicate a marked reduction in losses from mold and other decay, thus permitting the storage of fresh products for longer periods before processing.**

Experiments now being conducted with pineapples and cantaloupes indicate that similar results will be attained, and also that an improvement in flavor will result from the ripening action of the gasses.

The liquid is packaged in 50-gal. steel drums, which can be shipped to any point. It is applied by placing the required quantity in the bunker of the railroad car or motor truck. The liquid vaporizes, filling the storage space with a fog-like atmosphere which envelops the entire shipment.

■ **Shipments thus protected have been made without ice, thereby resulting in a saving of from $40 to $125 per car.**

As far back as 1936, H. J. Keller, general manager of Skinner, began experiments in an effort to find a method of speeding up the de-greening time for citrus fruits. First used was a kerosene gas burner. By smothering the jet, an incomplete combustion resulted which produced traces of ethylene gas that colored the fruit. This process was not entirely successful, however.

The industry then went to the use of ethylene gas, but found that high humidity was required and this tended to cause decay spores to develop rapidly. On the other hand, if the humidity was brought too low, shrinkage—as much as 2 percent by weight in 24 hr.—would result. As early season fruit is frequently held from 72 to 100 hr. before being processed, a profit-consuming weight loss could be entailed at low humidity.

So the problem was to find a method that would combine high humidity with no decay.

Then, by the familiar method of

trial and error. Mr. Keller finally hit upon a combination—a high humidity operation that would cut down evaporation and at the same time check the growth of mold spores.

Mixture De-Greens Quickly

The first test was a simple de-greening operation on grapefruit. Samples of the fruit were divided into two portions, one being treated with straight ethylene gas, the other with ethylene plus the Skinner process, which, though produced by a secret formula, is described as a mixture of chlorinated hydrocarbons.

■ **The de-greening time for straight ethylene was 36 hrs. while the special mixture produced the same result in 24 hr. Not only was there a 12-hr. saving in time but the de-greening job was better done and there was less loss of weight. Even some of the fruit that was slightly damaged showed no evidence of decay after being removed from the treating chamber. And the "packout" (a term used in the citrus processing industry to indicate the amount of shippable fruit in a given lot) ran 76 percent with the ethylene-Skinner mixture—15 percent better than the 61 percent for straight ethylene gas.**

Prevents Decay, Too

Believing that he was now on the right track, Mr. Keller continued his experiments for some time, mostly on citrus fruits. In order to simulate the most serious conditions that might be encountered, fruit was inoculated with both stem-end and blue mold decay and placed in air-tight bottles with 100 percent humidity. The contents of one bottle (treated), showed no decay after 8 days, while the contents of the other (untreated) bottle, showed 100 percent decay in 24 hr.

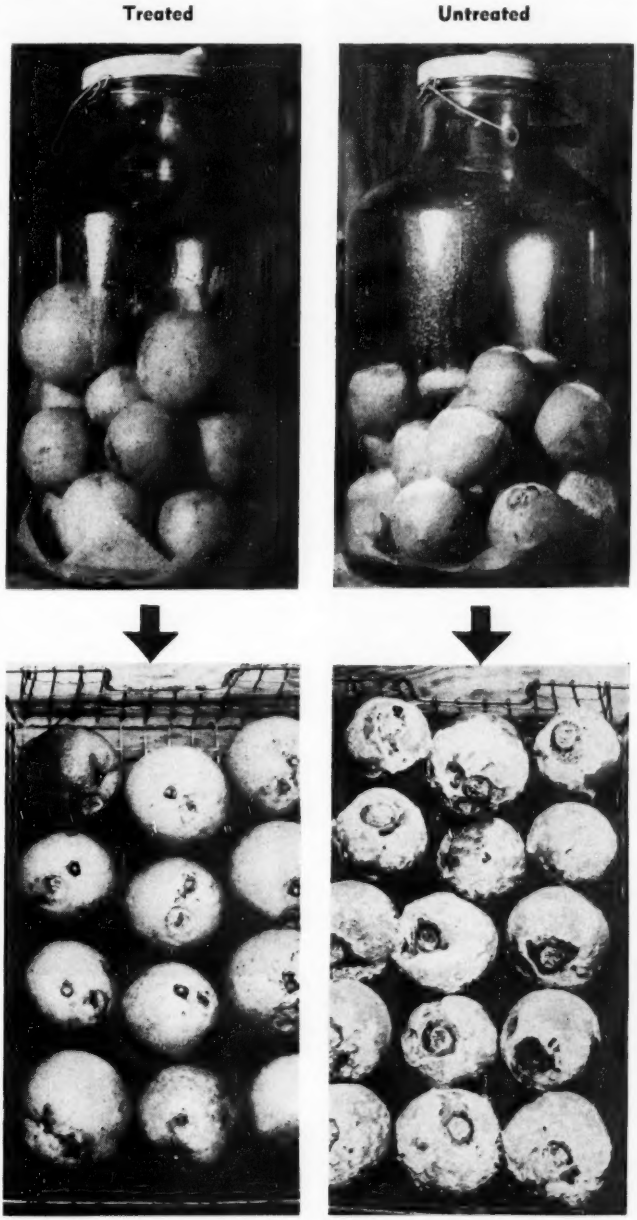
There were many subsequent tests. One of these, for example, was on inoculated oranges, divided into two lots, one treated for 24 hr., the other not treated. A photo taken after 17 days showed very little indication of spoilage in the treated lot, whereas all the untreated fruit showed signs of decay.

Another test on two groups of inoculated oranges showed the following results: After 5 days, treated fruit no decay, untreated 10 decay; after 9 days, treated fruit 4 decay, untreated 13 decay; after 11 days, treated fruit 8 decay, untreated 18 decay; after 16 days, treated fruit 10 decay, untreated 27 decay.

Crates of oranges, as packed for commercial shipment, were later tested under similar conditions. After 18 days, the crate that had been

(*Turn to page* 157)

BOTTLE TEST: It Proved Gas Idea Sound



IN TESTING NEW TECHNIC, Researcher Keller simulated severe conditions affecting the fruit. He inoculated oranges with decay spores, gas-treated half of them, then placed the two lots in closed jars with 100 percent humidity. Top photos: After 8 days, treated oranges (left) were in good condition, whereas untreated (right) were badly decayed (in fact had decomposed after only 24 hr). Lower photos: After 11 days, fruit was removed for closer examination. By then, some of treated oranges (left) had developed stem-end decay. But all untreated fruit (right) was rotten.

LEWIS-SHEPARD SPACEMASTER "61" is new electric truck with 4,000-lb. capacity. Has 65¼-in. free lift, 127-in. fork elevation. Features 61-in. turning radius.—Lewis-Shepard Products, Inc., Watertown, Mass.

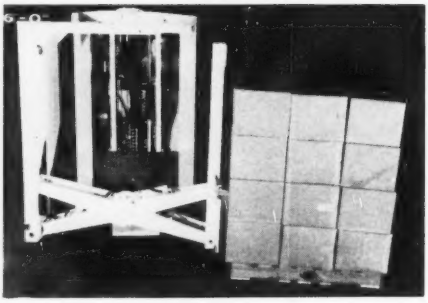
YOUNG EXPEDITER is walking gasoline hand truck that carries 800 lb. at 6 mph. and is very maneuverable unit. Has 3½-hp. air-cooled engine. Special front frames handle variety of jobs.—Young Iron Works, Seattle.

HYSTER SALSBURY truck carries 4,000 lb. at 8 mph. Has unique interchangeable turret power unit with 6-hp. air-cooled engine. Platform is 42 x 60 in. Features great maneuverability.—Hyster Co., Portland, Ore.

POWER MOVERS

What's new in materials handling equipment

BELL PRIME-MOVER is a walking platform truck which carries 1,500 lb. Available with 10-cu. ft. bucket. Has 5-hp. air-cooled engine. Is 68 in. long, 31½ in. wide—Prime-Mover Co., Muscatine, Ia.



AUTOMATIC'S new side-loader fork truck for aisles less than 6 ft. wide. Instead of turning truck at right angles to stack pallet load, forks can be swung 90 deg., right or left. Scissors action extends forks to put load in place.—Automatic Transportation Co., Chicago.

BUTLER "102" is scoop-type box-car unloader capable of carrying 1,000 lb. The 4-cyl., 25-hp. engine gives 11 mph. Scoop elevates 112 in. Turning radius: 6 ft. 3 in.—Butler Bin Co., Waukesha, Wis.

BUDA MODEL FT30-24 is new 3,000-lb. capacity truck with 24-in. load center. Free lift is 24 in., telescoping lift, 108 in. Its 4-cyl. engine drives load 45 fpm. Features rugged construction combined with quick disassembly for easy maintenance.— Buda Co., Harvey, Ill.

KNICKERBOCKER TRUCK-MAN is low-cost 4.4-hp. truck with a riding platform. Will move 3,000 lb. at 5 mph. Hydraulic lift handles 40- to 48-in. pallets.—Knickerbocker Co., Jackson, Mich.

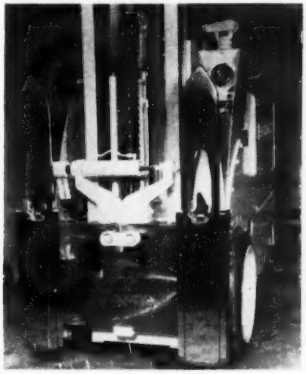
LYON-RAYMOND SPACEMAKER is extremely compact electric truck with a 2,000-lb. load capacity and 3¼-mph. speed. Width is 30 in.; overall length, 27 in. plus load.—Lyon-Raymond Co., Greene, N. Y.

BAKER TYPE FT is new 4,000-lb. capacity electric unit. Travels 5.3 mph., has a 126-in. telescoping lift. Features forks, side shifters, fork-spacer and clamp in one unit.—Baker-Raulang Co., Cleveland.

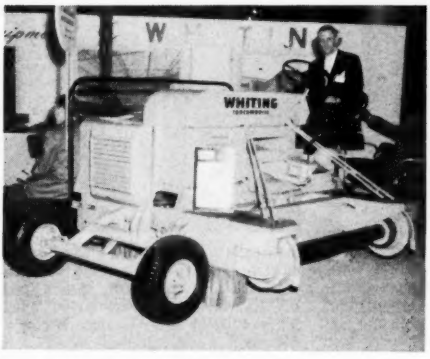
ON PARADE...

as revealed at recent exposition in Chicago

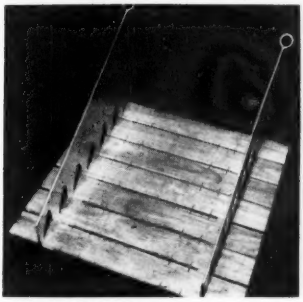
YALE DIESEL lift truck. First of its type in U. S., it is designed for use where fire hazards exist and fresh air is limited. Hercules 6-cyl. engine gives 13 mph. Primary lift is 66 in. Features hydraulic transmission and muffler which screens sparks.—Yale & Towne Mfg. Co., Philadelphia.



AUTOMATIC'S fold-away forks are designed to handle new hook pallet (below). In lowered position, forks take standard pallets.—Automatic Transportation Co., Chicago.

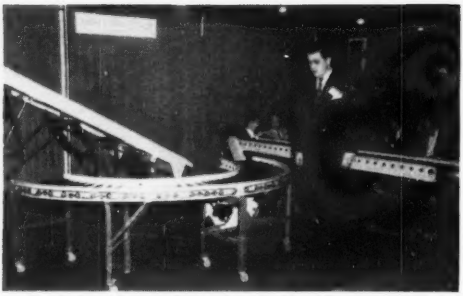


WHITING TRACK-MOBILE is a unique railroad car mover with road wheels at right angles to track wheels. Has 7,350-lb. draw-bar pull at 1.5 mph. in low. Powered by 4-cyl, 60-hp. engine, it pulls 1,100 lb. 20 mph. on the road, 9 mph. on tracks.—Whiting Corp., Harvey, Ill.



HOOK PALLET saves vertical space because it is about 5 in. thinner than standard pallet. Truck for handling it (above) operates in narrow aisle because forks fold up.—Automatic Transportation Co., Chicago.

STEUBING MODEL KP, powered walking-lift truck which carries 4,000 lb. Smallest model is 63⅜ in. long, 24 in. wide. It has two forward, two reverse speeds; will travel 2 mph.—Lift Trucks, Inc., Cincinnati.

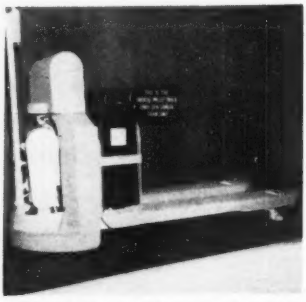


POWER DRIVEN CURVE, made in 90- and 180-deg. units. Rollers of 2-in. dia. are set in channels on 4- or 6-in. centers. A 1/3-hp. motor drives the curve at 45 fpm.—Harry J. Ferguson Co., Jenkintown, Pa.

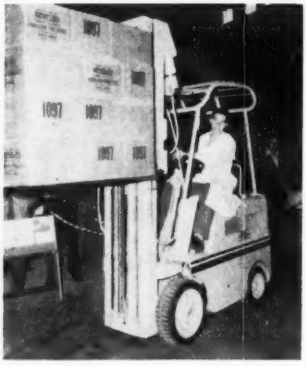
POWER MOVERS (Cont'd)

For more information about any item in this article, use Reader Service coupon (adjacent to inside back cover).

CRESCENT Electric Palletier Model C-4 has 4,000-lb. capacity at 24-in. load center. Speed, 5 mph.; maximum lift, 130 in.; free lift, 63½ in. Features hydraulic brakes and automobile-type drive.—Crescent Truck Co., Div. of Barrett-Cravens Co., Lebanon, Pa.



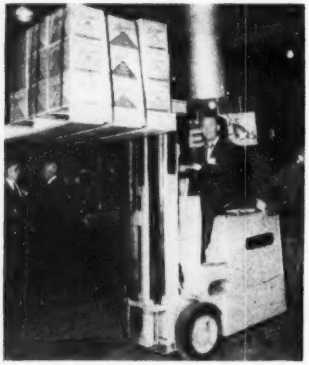
MOTO-TRUC SHORTIE model PAL-SC is a mere 22¾ in. longer than its load. Capacity is 6,000 lb.; speed, 3 mph. Has electric-hydraulic lift.—Moto-Truc Co., Cleveland.



CLARK PUL-PAC is special attachment that eliminates pallets. Load is placed on a thin carrying sheet over carrying plate. Gripper jaws load truck. Pusher rack removes load. Can handle 1,300 lb.—Clark Equipment Co., Battle Creek, Mich.

MOBILIFT TIER-MASTER has 2,000 capacity with 15-in. load center; 117-in. lift from floor; 47-in. free lift. Has 3-cyl. air-cooled engine. Two-way control levers eliminate gear shifting.—Mobilift Corp., Portland, Ore.

REVOLVATOR GO-GETTER, model 6-48, is new electric lift truck with capacity of 2,500 lb. It straddles 48 x 48-in. pallet, lifts 85 in., 115 in. and 156 in.—Revolvator Co., North Bergen, N. J.



MERCURY JEEP Model 230 is new electric fork truck of 2,000-lb. capacity with 130-in. extreme lift, 59½-in. free lift. Has foot-pedal acceleration. Turning radius, 60 in.—Mercury Mfg. Co., Chicago.

CMP: What It Is, What It Does

DO failed to do the job, so a Controlled Materials Plan takes over. It is designed to achieve proper distribution of scarce materials. Here is a brief explanation of CMP and how it affects our industry.

AS OF July 1, the Controlled Materials Plan supersedes the Defense Order rating system. DO failed to work because it provided no physical control over basic materials. As a result, a 50 percent equipment shortage was foreseen in some fields.

Stainless Steel Critical

Stainless steel has been driven out of circulation to a great extent. An official in the NPA steel division told the dairy equipment manufacturers group on April 17 that the dairy industry could obtain this year only 10 percent of the stainless steel used in 1950. More recently, NPA has advised unofficially that there is only 60 percent enough stainless steel to fill the defense orders approved by NPA for future delivery.

Only recently has NPA been able to control stainless steel starting at the mill level. This may explain why one food manufacturer was asked more than $3,000 for a machine which sold for less than $1,400 a year ago. Anyway, we can see that the food industries need CMP just as badly as do the defense industries.

CMP Controls Basic Materials

A controlled materials plan is what the name implies. It controls distribution and usage of basic raw materials such as steel, aluminum and copper, from ore to end products. Complete control is absolutely necessary to avoid black market operations under existing conditions.

Insofar as the food industry is concerned, CMP protects materials and component parts needed for maintenance, repair and operating replacements.

CMP will eliminate some DO abuses by limiting materials or facilities to definite allotments, beyond which even the military cannot go without getting an additional allotment (theoretically, at least). Moreover, processors can no longer, under CMP, write their own tickets under DO-97. This has been superceded by CMP. The cut-off date is that of the CMP-MRO regulations.

CMP in World War II and Now

It was 1943 before CMP was introduced in World War II. Now a CMP is in existence less than nine months after creation of NPA. In the earlier case, however, the War Food Administration was set up to administer the allocation of basic materials and facilities which were allotted by the War Production Board. This was accomplished by absorbing the Office of Materials & Facilities set-up in the Department of Agriculture right into the WPB organization.

There are two fundamental differences between the WFA program, which worked admirably, and the present set-up. First there has been a minimum overall allotment of basic materials and facilities to the food industry. Therefore it will be exceedingly difficult during "peace time" to administer CMP in behalf of the food industry. Second, OMF now is in the U. S. Department of Agriculture.

To some small extent, industry men have been placed in key positions, or used as consultants, in OMF. Hitherto, however, they have been able to obtain from NPA help for the food industry only to the degree that any particular claim can be justified in comparison with defense claims. The final decision is NPA's, not Agriculture's.

Product Classes and Codes

Under CMP, all products are divided into two classes, A and B. Class A is reserved purely for defense purposes, and Class B covers all civilian-type requirements. Class B is further subdivided into two classes: Products for which a quota or allotment of raw materials has been set up and those for which only MRO allotments have been established. The latter products are identified in the official CMP Class B product list by asterisks (*).

The official Class B product list codes follow the B-product portions of the 5-digit product classes used by the Census Bureau in 1949 and 1950 annual surveys of manufacturers and by NPA in reporting on form NPAF-1. Where more than 5 digits are used, the product comes under the jurisdiction of more than one NPA division. Where 4-digit codes are employed, the census classes were regrouped to facilitate reporting on Form CMP-4B.

A directory is furnished by NPA so that a product in which a person is particularly interested may be easily found with its pertinent identifying code number.

Food Processing Allotment

In general, all food processing materials and facilities are included among the regular CMP-B product items (without asterisk) except for bottling equipment (asterisked). However, this is not quite so favorable as it may appear on the surface, at least for the remainder of this year.

In allocating controlled materials for the third quarter, the base period used was the first two quarters of 1950, when food equipment manufacturing in many lines was at low ebb. So the amount allotted may constitute a sizeable cut from the present rate of operations for most food machinery manufacturers.

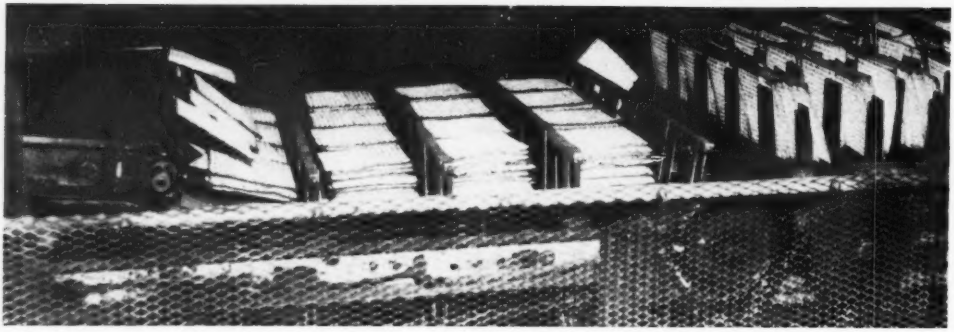
For the third quarter of 1951, at least, production of materials will remain at the levels of the first two quarters in 1950. Practically, this may mean not much more than MRO.

Applications must be presented by equipment manufacturers on Form CMP-4B for all basic materials in excess of the following amounts: Carbon steel, 5 tons; alloy steel, 1,000 lb.; stainless steel, zero lb.; copper and copper base alloy, 500 lb.; and aluminum, 500 lb.

Surprisingly, the food industry has not yet been seriously affected by the

(*Turn to page* 220)

They're quickly weighed, then flipped up for fast packing

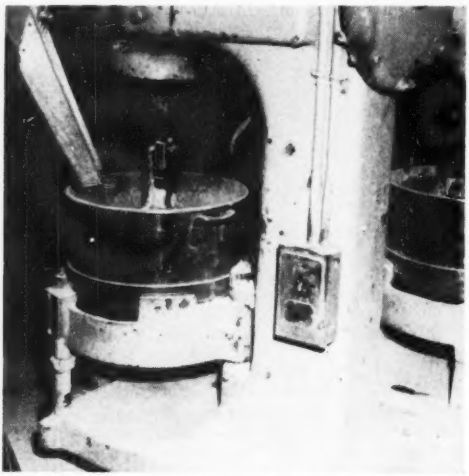


FED FROM oven on conveyor (left), the 6-by-6½-in. matzoth drop onto counter-balance scale. Then (center) they are neatly turned up to form handy edgewise lots that the workers can rapidly grasp and place in the cartons.

Lots move right to cartons

WORKERS pack matzoth into cartons, which are then put on conveyor (top) leading to sealing machine.

Mixing also more efficient



FLOUR is automatically weighed and fed via chute into mixing bowl. Small pipe meters-in the water.

Weigher-Stacker Speeds Matzoth Line

Enables Goodman's to package cracker-like bread in less than half of former time. Improved, too, are dough mixing and feeding, also sealing and coding

AN INGENIOUS weigher-stacker is outstanding among a series of improvements in the matzoth (also commonly spelled *matzo*) line at A. Goodman & Sons, Inc., Long Island City, N. Y.

Other company innovations for processing this cracker-like unleavened bread made of flour and water are: (1) Semi-automatic dough mixing; (2) continuous feed of dough into the rollers; (3) elimination of glue hardening on sealing machines; and (4) a self-operating coder.

The weigher-stacker was developed three years ago by company engineers. It automatically stacks matzoth horizontally, direct from the oven conveyor; weighs out enough to fill a package; then turns the matzoth on their edges so that workers may most easily take the bunches and place them in the cartons.

Before, five workers were needed. But with this new equipment in action, two men pack the same amount.

The unit consists of two separate conveyor sections: The first for carrying matzoth stacked horizontally, the second for vertical batches.

As can be seen in the accompanying illustration, the first section has fine permanently-mounted steel bands around whose ends the conveyor rotates. Bands are 4 in. wide and 41 in. long, with 4½ in. between. Two chains at the outer edges of the first and fifth steel bands, attached by channel-shaped bars, form the moving portion of the conveyor. Flights that are 4 in. high and 4 in. wide hang down from the channel-shaped bars in-between the steel bands, making five flights to a row.

The first 8 in. of the steel bands (right next to the oven conveyor) are actually separate and form one part of a counter balance scale.

Base of the second section of the weigher-stacker is a wire-mesh conveyor. Steel bars are fastened to the wire every 4¾ in. Vertical flights, each 5 in. high and 2¾ in. wide, are attached to the bars, the spacing corresponding with the flights on the first section.

Four or five lines of matzoth from the oven conveyor fall onto the scale portion of the steel bands, up against a flight. The scale (counter-balance type) can be pre-set to any weight, usually 12 oz. (about 11 matzoth) or 20 oz. (18 matzoth). When this weight is reached the scale makes electrical contact with a ratchet that moves the conveyor a notch (7½ in.) forward. There is no interruption of flow from the oven.

Four notches later, the horizontal batch of matzoth is ready to be turned to a vertical position onto the second section. At this point, edges of the batch are resting on the extended steel bands. Flights from the second section come up from underneath and swing the horizontal batch to vertical.

Since there is only 4¾ in. between flights on the second section, matzoth stay upright by leaning on the flight ahead. Eighteen matzoth make a snug fit, but 11 matzoth lean at an angle of about 15 deg. from the vertical.

A clever arrangement prevents the first conveyor from moving while the second is in motion (otherwise flights would crash into each other). At the edge of the second conveyor, each bar is attached by semi-spherical headed screw. At each "stop" position, the screw head makes physical contact with a protruding cylinder (¼-in. dia., ½-in. long), which, in turn, makes electrical contact with a ratchet assembly for the first section.

The first conveyor can move only when this contact is made. And when it moves ahead a notch, another ratchet connection (mechanically controlled by the first) allows the second conveyor to move ahead a notch. While the second conveyor is moving, therefore, there is no contact with the protruding cylinder and the first is prevented from moving, even if someone touched the scale.

There are about 30 rows of flights on the second conveyor, allowing a large enough pile-up in front of the packagers. Empty cartons are conveyor-fed to the end of the second section. Two men continually take the bunches of matzoth and place them in the cartons. They then place the cartons on a second belt conveyor that runs to the carton-closing machine.

Semi-Automatic Dough Mixing

Now let's go back to the beginning of the line to pick up the other improved methods: Two 80-qt. mixers and only one operator are employed. Goodman's has the mixing units mounted on one base that rotates on a ball bearing fixture embedded in the floor. This easily pivots by hand.

Flour is automatically weighed and chuted into the bowl—48 lb. at a time. A screw conveyor on the bottom of the flour hopper feeds to a bucket elevator going about 8 ft. up. This discharges into another worm which drops the flour right onto a scale that measures out a batch. When the operator is ready, all he does is raise the scale door and the flour drops into the mixing bowl.

At the same time, water is automatically metered in by float control, the operator pushing a button to start the flow.

Another button is pushed, and the 2-hp. motor starts the mixers turning. By this time, the second mixer has stopped. Operator pivots the bowl on a 2½-ft. high post having a rubber pad on top to provide a cushion. Thus, semi-automatic dough mixing is achieved in this small-size operation. The 64-lb. batch of dough now falls into a 45-deg. bucket elevator, which dumps the dough into the molder hopper.

Continuous Feed to Molder Hopper

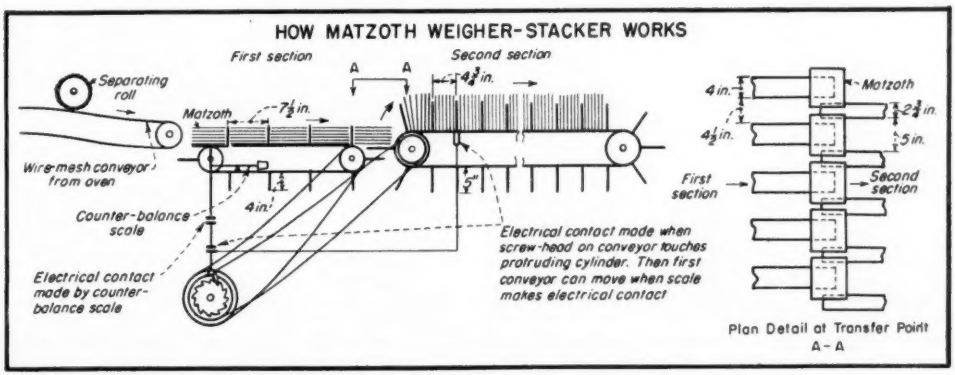
Near the bottom of this hopper, a spring-operated electrical contact stops and starts the bucket elevator. If there's enough dough in the hopper, the spring is compressed and there is no electrical contact, and no elevator movement. When the dough starts running low, the spring pushes out and makes a contact that starts the bucket elevator up with another load of dough. The spring is so placed and adjusted that there is a continuous flow of dough at all times. The elevator is driven by a 1-hp. motor.

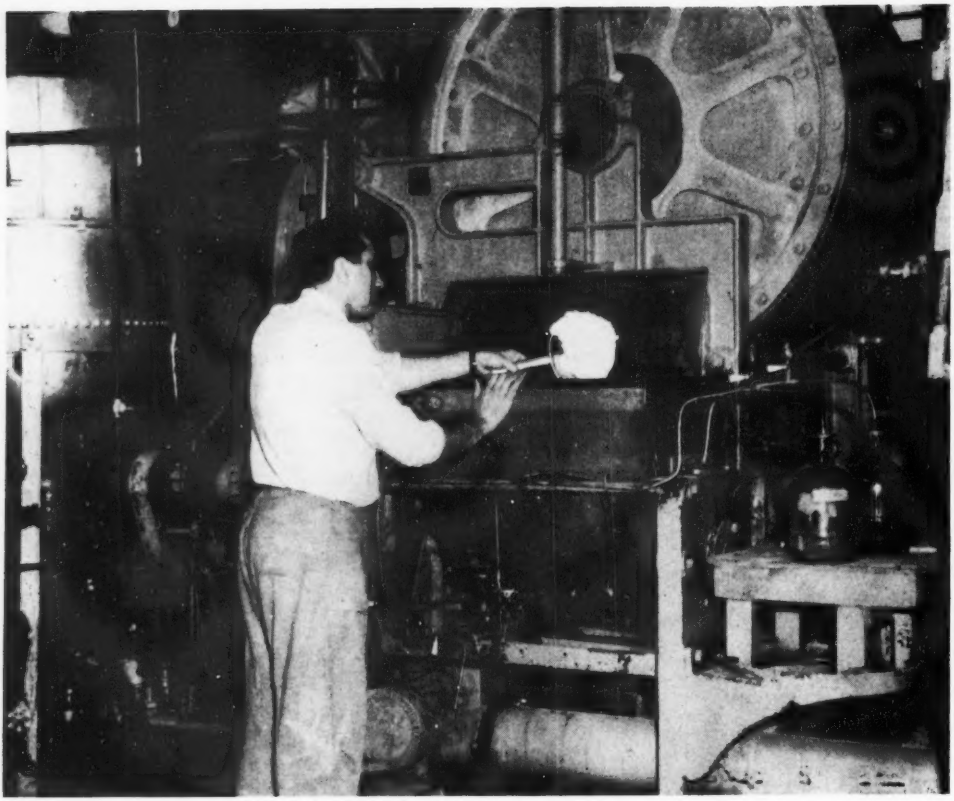
The oven, 90 ft. long, is a standard gas-fired unit, which has a ½-in. mesh sectional steel wire belt running at 42 fpm. It has 67 burners distributed along the way and is powered by a 5-hp. de. motor. Some 288 matzoth are turned out each minute (1152 lb. an hour.). Another similar, but slightly smaller, oven provides the extra output to make a total capacity of 2,000 lb. per hour.

Mirror Spots Pile-Ups

How the weigher-stacker works has already been described. Next unit is an automatic carton machine that bottom-seals 36 empties a minute and top-

(*Turn to page* 156)





CONTINUOUS production of starch-caste centers—2,000 lb. per min.—is achieved by this efficient Baker-Clay unit.

How Advanced Units and Technics Will

SEND UP YOUR VOLUME

Confectioner zooms his output by using bulk sugar-handling system, continuous sugar-wafer and starch-jelly candy lines, automatic cream center-forming units, and highly efficient packaging methods

JOHN V. ZIEMBA
Assistant Editor, "Food Engineering"

Notable in the candy-making operations at Edgar P. Lewis & Sons, Inc., has been the constant adoption of the newest equipment obtainable and the most advanced processing technics. Furthermore, engineers of this Malden, Mass., company have designed their own equipment whenever suitable machines have not been available.

■ **Spurred by the many engineering changes, output quickly shot up to meet the growing demand for the company's quality confections.**

At the same time, the innovations have helped to reduce production costs, improve sanitation, and maintain top quality candies. And here is a figure that decidedly speaks for itself: Productivity on a dollar-volume basis is now 6¼ times as high per worker as in 1940.

Credited with streamlining the operations to front-line status in the confectionery field are President Richard S. Lewis, Treasurer Paul E. Lewis, and Plant Sup't. Charles Carilli.

Big Six

Every one of the numerous phases in the firm's operations invite the spotlight. However, the following six are outstanding in specially reflecting the 1951 efficiency:

1. Receiving and handling, in bulk, of 40,000 lb. of granulated sugar per day.

2. Turning out 1¾-oz. packages of sugar wafers at the rate of 60 per minute.

3. Reclaiming broken wafers by conveying them directly into a micro-pulverizer.

4. Making fondant and cream centers continuously at the rate of 2,000 lb. per hour, then directly piping the centers to a depositor.

5. Manufacturing starch-jelly candies continuously with the aid of automatic units.

6. Adopting the latest machines to package a variety of starch-jelly confections.

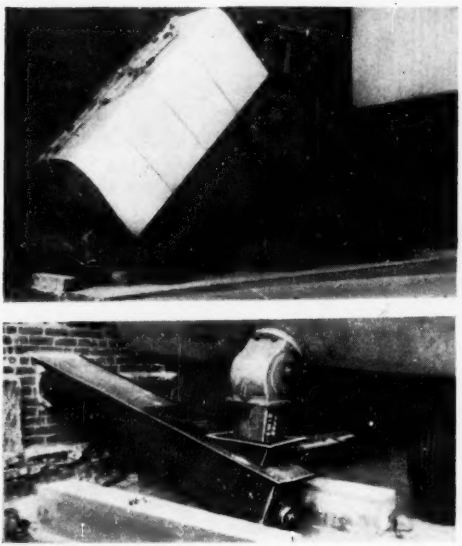
Now for a detailed description of these improvements in the order in which they were named:

1—Bulk-Sugar Handling

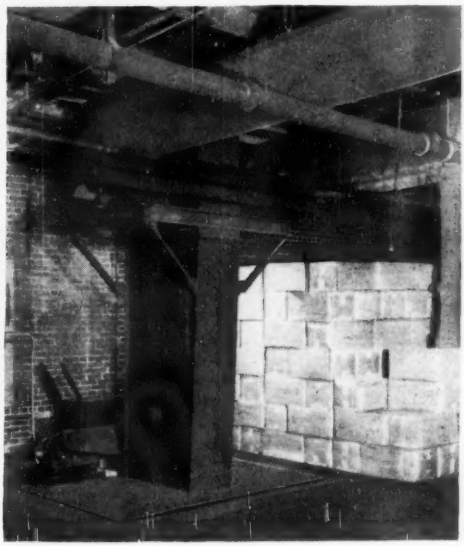
Installation of an automatic bulk sugar-handling system by J. C. Corrigan Co. engineers has brought about six in-plant benefits.

There has been a marked reduction in labor costs, an increase in sugar-storage capacity without need of enlarging the plant, and additional floor space has been made available for other production lines. Also,

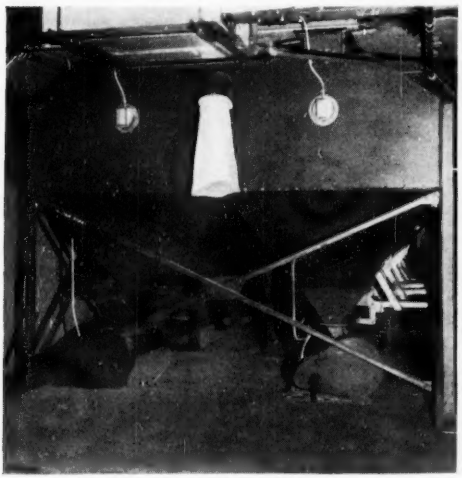
In-Plant Bulk-Sugar Handling System Is Big Labor-Saver



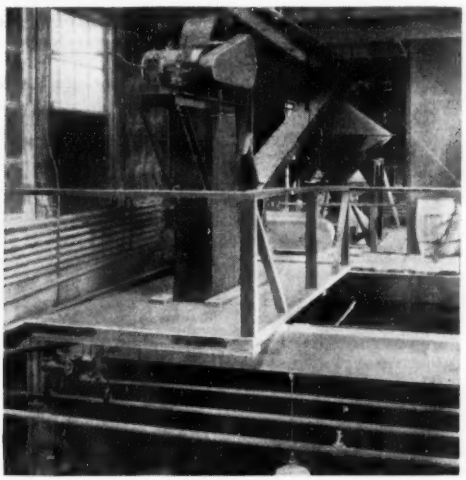
TRUCK (top) is tilted to deliver 20 tons of sugar to plant. Above: Closeup shows truck hook-up with receiving bin.



INSIDE plant, bucket elevator carries sugar into two horizontal screw conveyors (top) that feed storage bins.



METAL BINS hold total of 100,000 lb. of sugar. Floor-level screw conveyors collect sugar from 22 bins.



SECOND bucket elevator lifts sugar four floors for feeding (background) into spiral bin and pulverizer.

chances of running short of sugar during processing have been minimized, sugar losses due to sifting and clinging of grains to sacks have been prevented, and sanitation and plant appearance have been improved.

As for the cut in labor costs, the bulk system has eliminated unloading, stacking, warehousing, rehandling, and bag-salvaging. In so doing, the present system requires only one man, whereas the old method needed six.

Formerly, sugar was trucked to the plant in 100-lb. bags, which workers then loaded onto hand trucks and transported to the first-floor storage area. Bags were then unloaded and stacked on skids. When sugar was needed, the bags were reloaded onto hand trucks, rolled to a freight elevator, and carried to the fourth floor. Here, each bag was ripped open and the sugar was fed into a micropulverizer.

Besides the inefficiency of multiple handling, this system imposed a great strain and burden of heavy manual work on the employees. There was griping and general morale suffered.

But now, automatic conveying of bulk sugar—from delivery truck to storage bins, and then to micropulverizer—has done away with such handling.

Trucks with specially designed, enclosed dump bodies of stainless steel haul 20 tons of bulk sugar from the Revere Sugar Refinery to the candy plant. These trucks are easy to load and to unload, and they are completely sealed against dust and leakage.

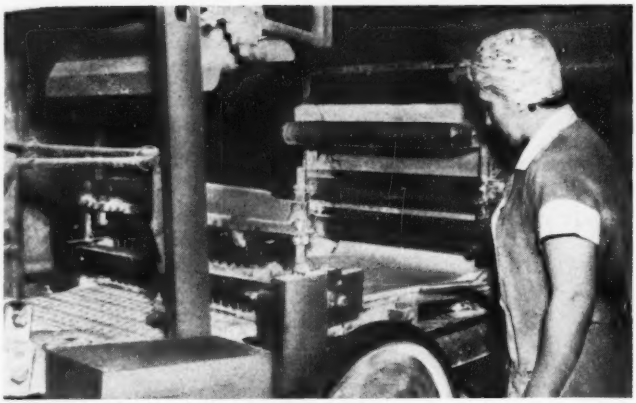
Sugar is discharged from a truck directly into a small, closed receiving bin outside the plant. The truck is tilted by built-in hydraulic equipment. From the receiving bin, an inclined screw conveyor carries the sugar into the plant, where a bucket elevator feeds it to two horizontal screw conveyors. Each conveyor delivers the sugar into eleven split-type metal bins. Capacity of the 22 storage bins is 100,000 lb.

Each bin has a bottom hopper with a quick-action slide valve that discharges the sugar into a floor-level, horizontal screw conveyor. There are two worm screws, one for each row of eleven split-type bins. The screw conveyors deliver the sugar to a bucket elevator that feeds the fourth-floor micropulverizer. The handling system has facilities for by-passing the pulverizer, if the process calls for granulated sugar.

2—High Volume Wafer Line

Greater efficiency has been attained on the sugar-wafer line through adoption of continuous methods for extruding and forming the lozenge paste into a sheet, and stamping out the wafers, that are then dried, assorted, screened, stacked, and packaged.

Greater Efficiency Attained

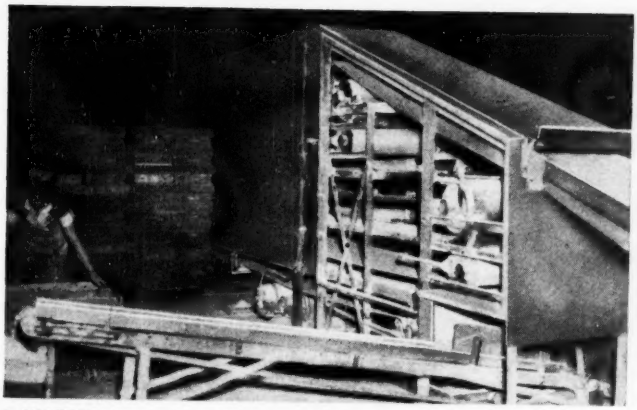


1 **LOZENGE-CUTTER** forms candy paste into thin sheet, which is automatically stamped by double row of dies into 1-in. dia. wafers.

3 **DUMPED** from trays onto canvas-belt conveyor, wafers are assorted and screened on vibrating unit below belt. Wafer pieces are reclaimed.

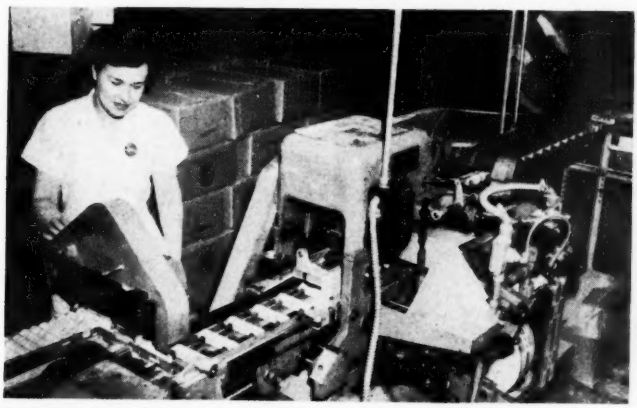
5 **MACHINE-FORMED** at the rate of 90 per min., Kliklock boats are inserted into 26 wooden trays mounted on merry-go-round packing table.

On New Sugar-Wafer Line



2 **WAFERS** travel back and fourth through continuous, multi-tier cooler. Rate: 1,000 ft. per hr. Unit is equipped with six 80-ft. canvas belts.

4 **SPECIALLY DESIGNED** assembling unit (background) automatically stacks sugar wafers, which are then hand-packed into cardboard boats.



6 **BOATS** of assorted sugar wafers are machine-wrapped with cellophane or glassine film, then heat sealed. Output is 60 boats per minute.

This is how speed and volume are achieved in turning out this 5¢ item:

Sugar is pulverized so that it is fluffy and the crystals are of uniform size. All ingredients are weighed, introduced into a horizontal dough-type mixer, and blended. Then color and flavor are added for the different varieties. Batches containing 350 lb. of lozenge paste are fed into the hopper of the cutting machine, which produces 350,000 wafers per hour.

This machine comprises three units—an extruder, sheeter, and cutter. The extruder is equipped with six 4-in.-dia. worm screws that force the paste through a rectangular aperture to form a ¾-in. thick by 18-in. wide sheet, which is further reduced to wafer-thickness (3/16 in.) as it passes between two pairs of sizing rolls. Continuing through the machine, the sheet then goes to the cutter, where 1-in. dia. wafers are stamped out, 38 at a time, by a double row of reciprocating cutting dies.

Material left from between the wafers is returned by conveyor to the hopper above the cutter and re-used. The wafers are conveyed to a multi-tier, continuous, room-temperature dryer, equipped with six 80-ft. belts. Temperature of the wafers traveling through the company-built dryer is reduced from approximately 140 to 70 deg. F. Speed of the belts is 1,000 ft. per min.

From the dryer, the wafers discharge into wooden, screen-bottom trays that hold about 25 lb. These mesh-bottom trays facilitate circulation of air among the wafers and thus hasten further drying. The trays are stacked overnight.

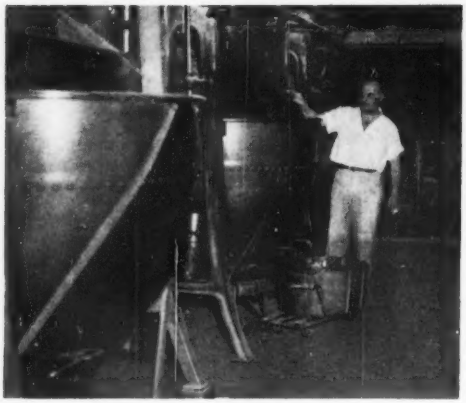
Both mixing and screening of the wafers are continuous operations, and are done twice. First, trays of the wafers are dumped onto a 3½-ft. wide by 10-ft. long table to form five layers of the different flavors. Mixing takes place as a ratchet-driven stop-and-go canvas-belt conveyor at the bottom of the table tumbles the wafers onto a vibrating screen with ⅞-in. dia. perforations. Speed of the belt is 1 ft. per min.

The screen removes broken pieces of wafers, which are collected in barrels and later reclaimed. Whole wafers are gravity-chuted to the floor below and collected in wooden trays.

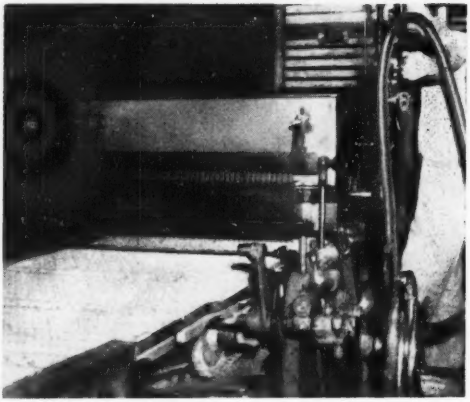
Immediately before packaging, the wafers get a second mixing and screening. Wafers are dumped from trays onto inclined canvas-belt conveyors that carry them to vibrating screens. Whole wafers then continue to two automatic stacking machines—units designed by company engineers.

An ingenious technic, paying off well in the packaging department, is the wafer-stacking and carton-packing

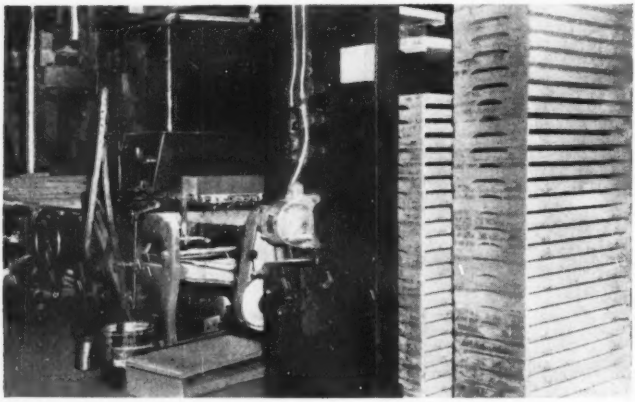
Starch-Jelly Candy Line Features Automatic Units



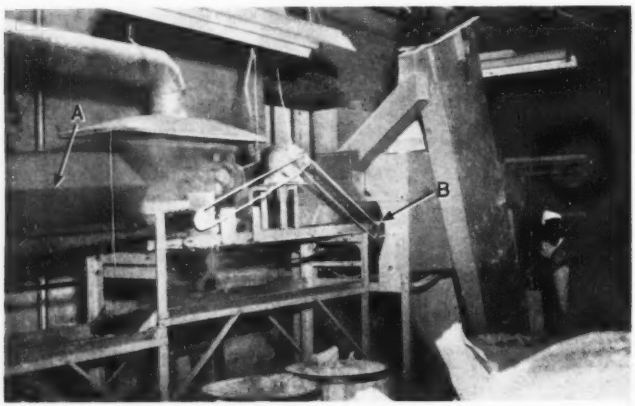
1 **INTO THESE** kettles are put corn syrup, liquid sugar, and starch-slurry. Mixture is cooked to 242 deg. F.



2 **MOGUL** casting machine automatically deposits measured amounts of gum jellies into starch impressions.



3 **AUTOMATIC STACKER** is seen placing trays of starch-caste jellies on skids. Later, loaded skids are transported to nearby drying room.



4 **SANDING** gum drops. Candies are conveyed through steaming chamber (A), and then fed into sanding drum (B), where they are coated with sugar.

system, which has reduced labor costs and floor space by almost two-thirds.

Formerly, each girl took five different flavored wafers from trays directly in front of her and packed them into a cardboard boat, which was then cellophane-wrapped by hand. It took 18 girls to pack the same amount of wafers which is now done by only 7 girls.

Now thoroughly mixed and screened, the wafers are chuted to the two stackers alongside a merry-go-'round packing table—another company-designed unit.

Automatic stacking is accomplished by pairs of pivoted metal arms that guide the wafers into 15 narrow, sloping chutes through which the candies slide in a flat position. These paired arms swing together and separate in a pincher motion to slide the wafers into line with the chutes. At the bottom of the chutes, wafers are turned on edge and stacked automatically. Then two girls, stationed at each stacker, pack the wafer stacks into Kliklock cardboard boats.

These boats are machine-formed at the rate of 90 per min. Then they are manually fed into 26 wooden trays on the merry-go-'round packing table. Each tray holds ten boats.

Filled with wafers, the boats are next fed by another girl to a Package Machinery Co. wrapping unit. This machine, equipped with an electric-eye measuring device, cuts roll-fed, printed, heat-sealable cellophane or glassine to proper length and then overwraps each boat at the rate of 60 per min. Leaving the wrapping machine, the boats go to a 2½-ft. long by 3-in. wide compression belt that seals the transparent wrapper to the bottom, thus finishing the package.

3—Reclaiming Broken Wafers

Still another labor-saving improvement has been the installation of a continuous conveying system for reclaiming broken sugar wafers. Barrels of broken wafers, holding approximately 225 lb. each, are dumped into a floor-level receiving hopper at the rate of one barrel every 9 min. From this hopper the broken pieces are delivered by a screw conveyor to the continuous micropulverizer, which reduces them for re-use.

4—Cream Centers at 2,000 Lb. Per Hr.

Adoption of the Baker-Clay process for continuous manufacture of fondant or starch-caste centers is still another contribution to greater efficiency. In reality, this automatic unit provides a continuous application of the "bob" process for making starch-caste creams.

Until this machine was employed, an excessive amount of labor was required to make cream centers. Moreover, the quality of the manually-made cream centers was not uniform.

But now, one man operating the Baker-Clay machine can produce 2,000 lb. of uniform-quality creams per hour. What's more, creams of all types can be made—from those that set in 30 min. to those that are left overnight in starch trays. Creams are also prepared to "set-up" quickly upon removal from starch and yet "come back" (to a liquid or semi-liquid consistency) after being coated with chocolate.

Let us describe the steps taken in the manufacture of starch-caste creams by the continuous process:

Liquid sugar, corn syrup, and water are metered into three 700-lb.- capacity, steam-jacketed precook kettles. Bulk sugar is added here, too. After a batch is cooked to 242 deg. F., it is gravity-fed through a fine-mesh screen into a rectangular, stainless steel, 1,000-gal. holding vat and then pumped to the continuous cream-making unit.

The cooked syrup flows into a 3x4x8-in. hopper, with an adjustable gate for separating it into two streams. A 60-percent portion of the syrup—the first stream—is diverted onto the surface of a cooling drum, rotating at 10 rpm. As the thin film of syrup is chilled to 110 deg. F., a stationery knife scrapes it off the drum. Next, the chilled syrup drops into a hopper that feeds a water-jacketed creamer. The latter unit has four horizontal beaters that whip the syrup into a creamy fondant.

The second stream—40 percent of the syrup—flows through a steam-jacketed pipe to a point directly below the discharge end of the cream beaters. Here, the hot syrup is mixed with the cooled and beaten fondant. Next, both the syrup and fondant are screw-conveyed to a junction box. At this point, color, flavor, and frappe (or marshmallow) are introduced continuously—solutions of color and flavor coming from gallon bottles and frappe from the junction box.

A 10-in. dia., horizontal water-jacketed worm-screw now continuously mixes and cools the ingredients, ready for depositing. Finally, the cream is pumped to a hopper for automatic depositing into starch impressions.

5—Automatic Starch-Jelly Line

Other highly significant advances—adoption of liquid-ingredient metering devices, depositors for casting candies into starch molds, automatic stacking units for starch trays, continuous sugar-sanding machines, and temperature and humidity controllers for the drying room—have enabled the company to step up the production in its starch-jelly candy department.

These confections are produced on a high-volume basis in the following manner:

Corn syrup and liquid sugar are metered into six 650-lb. capacity steam-jacketed kettles. Starch-slurry, prepared in a stainless steel mixing vat, is then pumped into these kettles.

After the batch is cooked to 242 deg. F., it is chuted through a fine-mesh screen into a rectangular stainless steel holding vat. The starch-jelly candy now is pumped to a high-speed Mogul depositing machine. At this point, trays of starch are delivered to the impression-forming unit that automatically produces molds in the bed of starch. Then, measured amounts of gum jelly are deposited in the impressions by a triple row of pump bars.

Trays continue along the machine until they arrive at the automatic stacker. This unit stacks the boards on skids—two rows of 30 trays each. The skids are then transported to a large drying room. Drying of the candies takes place overnight at controlled temperature and relative humidity—85 deg. F. and 48 percent. Capacity of the drying room is 42,000 trays.

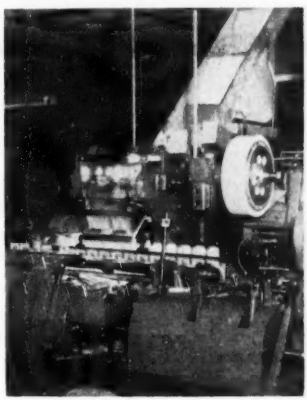
Next step is separating the candies from the starch and then reclaiming the starch. Trays are taken out of the dryer and stacked at the receiving end of the Mogul depositing machine. From here, all manual labor formerly required to invert the trays, separate candies from starch, clean the starch, and re-fill trays has been entirely eliminated.

A pair of arms feeds one tray at a time from the stack onto a chain belt that carries the boards to a dumping device. Here, the trays are automatically inverted over a cleaning sieve. Separated from the starch, the candies are then chuted to the sugar-sanding machines on the floor below.

(*Turn to page* 187)

Packing Gum-Jellies

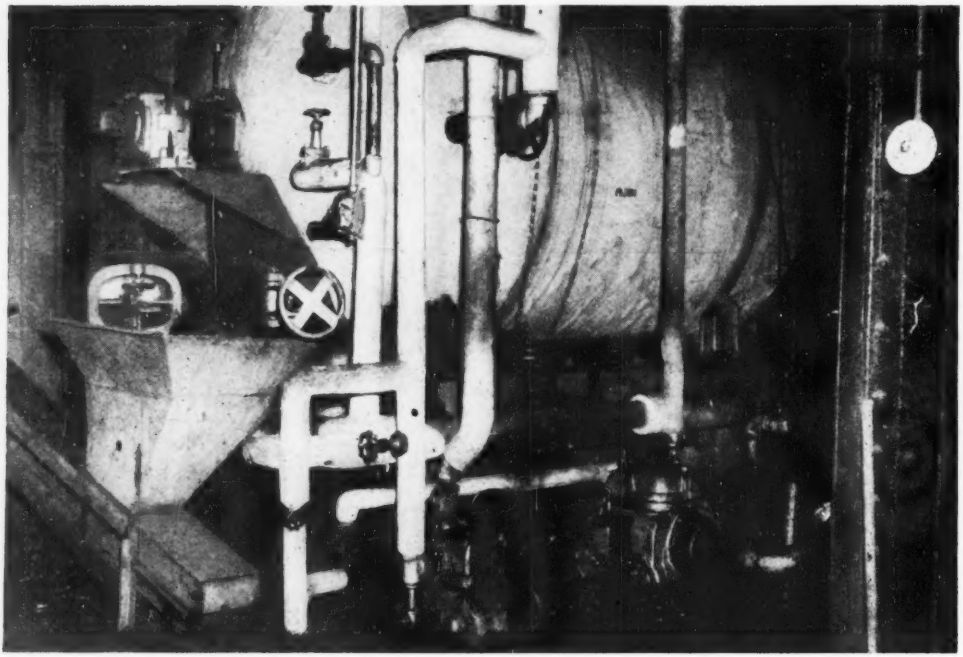
GIRLS pack five different flavors of starch-jelly candies in boats, which are machine-wrapped with cellophane.



GUM DROPS are automatically filled into wax-paper lined cartons. Speed: 120 1½-oz. packages per minute.

TWO Amsco units scale 8-oz. lots of licorice gum drops into window-type cartons at rate of 40 per minute.

Grease is removed from cracklings . . .



ROTARY EXTRACTOR is 9 ft. x 6 ft. with motor-driven double agitator arms. It is charged from floor above and emptied through the open door (left). Also shown is transfer pump for introduction of solvent and removal of miscella.

Solvent Extraction Saves $$$

Meat packer's switch from hydraulic pressing to chemical technic in processing cracklings brings big jump in grease—and cash—recovery

JOHN L. CARLSON
Process & Equipment Engineer,
John Morrell & Co., Ottumwa, Iowa

Savings in excess of $100 per day have been achieved by John Morrell & Co., pioneer meat packer, through adoption of solvent extraction for processing dry rendered cracklings at its Ottumwa, Iowa, plant.

In fact, the technic has proved so successful that the company is now seriously weighing its adoption at another Morrell plant.

The increased return resulted from recovery of an additional 4 to 6 percent grease formerly left in the 50 percent protein meal and bone scraps that are sold on protein content alone.

In the process of slaughtering livestock to obtain meats and meat products for human consumption, there is also produced a large tonnage of inedible materials. And in order to stay competitive, the packer must realize some cash return from these fat and protein containing materials.

To do this, he must separate the fat and protein so that they can be sold as: (1) Inedible rendered grease or tallow, and (2) an animal feed supplement.

Rendering Procedure

Two methods are available for effecting this separation:

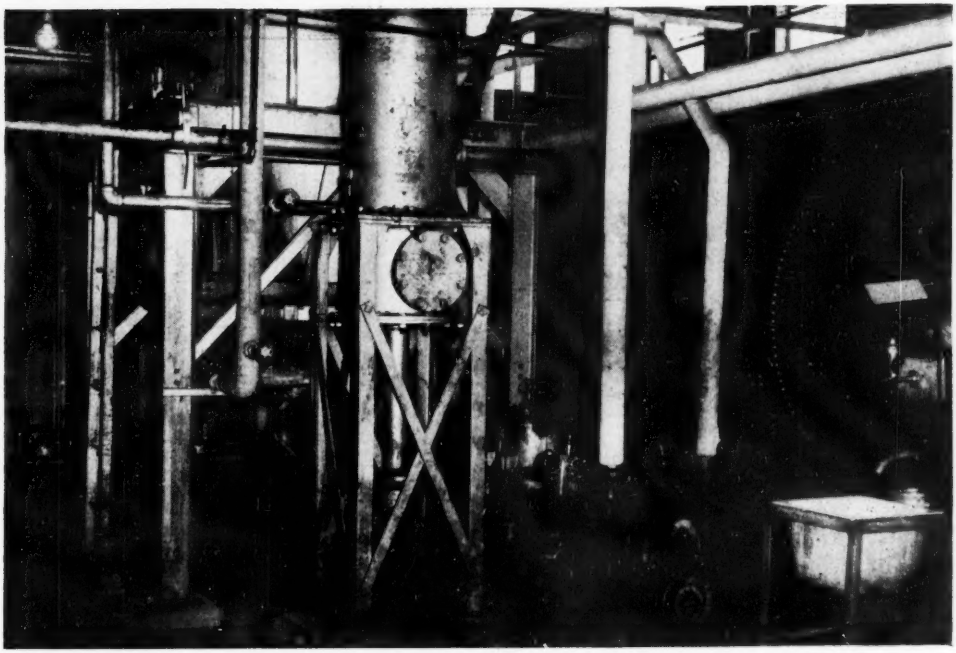
Wet rendering—heating the raw inedibles in a vertical pressure-vessel by direct steam injection at approximately 65 psi. When it is completed, the tank is settled and the fat drawn off. The protein residue is then blown to the slush box for settling and later processing to remove the high percent of water.

Dry rendering—charging the fat-bearing protein material into a jacketed, agitated, horizontal pressure-vessel referred to as a "melter."

It is this latter method with which we are concerned here. To start the process, steam is turned into the jacket of the melter. Upon reaching the end point of the rendering cycle, the agitator is stopped and the contents of melter are allowed to settle. After settling, grease is removed through a special fitting and the protein residue is dropped into a perforated, false-bottom box to allow additional free grease to drain off.

The cracklings (drained protein residues) contain upward of 35 percent

. . . then separated from solvent



STILL CONDENSER which separates solvent from grease. Miscella from tank (off left) is fed to still (rear) where solvent is boiled off under vacuum and then enters condenser (foreground). Recovered solvent is stored in tank (right).

fat. Inasmuch as they are sold on a guaranteed protein basis, no return is obtained from this fat. To reduce this high residual fat content the normal procedure is to hydraulically press the grease from the cake, using one of the various types of continuous screw presses available on the market. But screw pressing leaves a cake containing from 10 to 12 percent fat.

Improved Methods Explored

Realizing the magnitude of the losses incurred by this procedure, an investigation was made of processes which could be used to reduce the residual grease in the cracklings.

After a thorough study, it was decided that solvent extraction was the most attractive. Trichlorethylene was selected as the solvent, primarily because it is non-explosive, essentially nonflammable, and non-toxic at low concentrations. Working with the John Dupps Co., of Cincinnati, and representatives of the DuPont organization, a batch type extraction plant was designed. This unit is capable of handling approximately 4,000 lb. of grease-bearing cracklings per charge and can process about five batches in a 24-hr. day. The accompanying table gives pertinent data on its operation when extracting beef cracklings.

If tonnage of cracklings was larger, additional returns could be gained by converting from this batch to a continuous process.

Units Custom Built

The trichlorethylene batch-type solvent extraction plant requires a number of specially built pieces of equipment. It includes an extractor with condenser and pumps, a still with a condenser and a vacuum pump, a solvent storage tank, three miscella tanks, a grease tank complete with a transfer pump, and the solvent vapor recovery unit.

Heart of the system is the jacketed 6 ft.-dia. by 9 ft.-long rotary extractor, having double agitator arms driven by a 30 hp. motor through a roller chain and herringbone gear. Solvent is pumped to the extractor and miscella pumped from it, through nine filter pockets set in two rows along the base of the extractor. A 7 x 6 x 10 in. steam-driven duplex pump of 140 gpm. capacity is used. The condenser is fabricated with a mild steel head and shell and is fitted with stainless steel tubes. A 8 x 10 x 12 in. steam-driven vacuum pump is used to pull the vacuum in the condenser and extractor units.

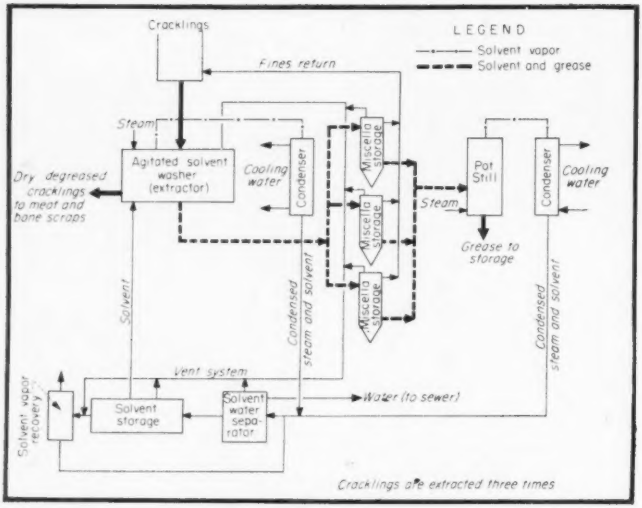
The still-condenser unit, in which the separation of the solvent from the grease is carried out, is also of mild steel construction with the tubes of stainless steel. The calandria of the still is supplied with 15 psi. steam through a 4 in. line. A 8 x 10 x 12 in. steam-driven wet-vacuum pump is used with this unit.

Tanks For Miscella and Solvent

Four storage tanks are required—8,000 gal. pure solvent tank and three conical bottom miscella storage tanks 6 ft. in dia. by 20 ft. high. The solvent storage tank is laid on concrete pads adjacent to the extraction plant.

The solvent vapor recovery system is made up of a 12 in.-dia. by 14 ft. scrubber of mild steel construction and a stripper of the same type construction and dimensions. Both the scrubber and the stripper are packed with 1 in. Raschig rings. Three heat exchangers, each having 25 sq. ft. of heat transfer surface, are provided. One unit acts as an oil cooler, one as an oil-"tri" mixture heater, and the third as a solvent vapor condenser.

ABC of Dry Cracklings Extraction Process



CRACKLINGS are charged into top of extractor and agitated with solvent. Then miscella is removed and residual solvent is steam-distilled from the degreased cracklings. Solvent is separated from grease in the pot still and, finally, water is removed in separator and solvent goes to storage. To prevent fouling of still with crackling fines, these are removed from miscella before distillation.

Necessary auxiliary equipment for the vapor recovery system consists of two transfer pumps, a flow meter, liquid level controller, and solvent-water separator, along with a number of thermometers. An absorption-type oil is used in the vapor recovery system.

How It Works

The sequence of operation of this system is as follows:

The extractor is charged with 4,000 lb. of high grease cracklings and the agitator motor is energized. Fresh solvent is pumped in and, when the extractor is full, agitation is stopped. The cracklings then rise from the bottom, and the grease-bearing solvent, or miscella, is pumped out to a miscella tank, through the nine filter pockets located along the base length of the extractor. This sequence is repeated three times, or until 3,000 gal. of miscella is obtained.

If 3,000 gal. are not obtained in three washes, a fourth or "polishing" wash is used; for it has been found that, with this volume of miscella, the final grease content of the extracted cracklings is in the desired range.

Since the miscella, as removed from the extractor, contains crackling "fines" in a large enough quantity to cause trouble in the still, a small amount of water is added to the miscella tank. After a period of mixing, then settling, the water-fines are removed by adding fresh solvent at the base of the tank and decanting. These fines are held in a blow tank and returned to the extractor when the next batch is charged.

Following removal of the miscella, steam is turned into the jacket of the extractor for approximately 120 min. to drive off the residual solvent in the cracklings. The extractor is held under 10 to 15 in. vacuum until a terminal temperature of 225 deg. F. is obtained in the cracklings. To remove further traces of trichlorethylene, stripping steam is passed through the cracklings. The solvent and water vapors produced in this drying cycle are condensed in the extractor condenser, pumped to the separator, where the solvent is recovered, and then the water, after flowing through a secondary separator, is discharged to the sewer.

Separation of oil and solvent is obtained by introducing the miscella into the still and injecting steam (15 psi.) into the calandria. The still is operated at about 22 in. vacuum. Solvent which is driven off is condensed in the still condenser and pumped back through a solvent-water separator to the solvent storage tank. Approximately 4 hr. are required to distill the 3,000 gal. of miscella from each batch extracted. Terminal temperature obtained in the grease is 235 deg. F. A 5-min. purge of live steam is used to remove any traces of solvent remaining in the grease after this temperature is reached.

In the solvent recovery system, rate of flow of absorption oil is approximately 3 gpm. Steam requirement for the stripper column is 2 lb. per min. Temperature of the absorption oil going from the cooler to the scrubbers averages 90 to 110 deg. F., from the oil heater to the stripper column 250 to 265 deg. F., and from the stripper to the cooler 220 to 225 deg. F.

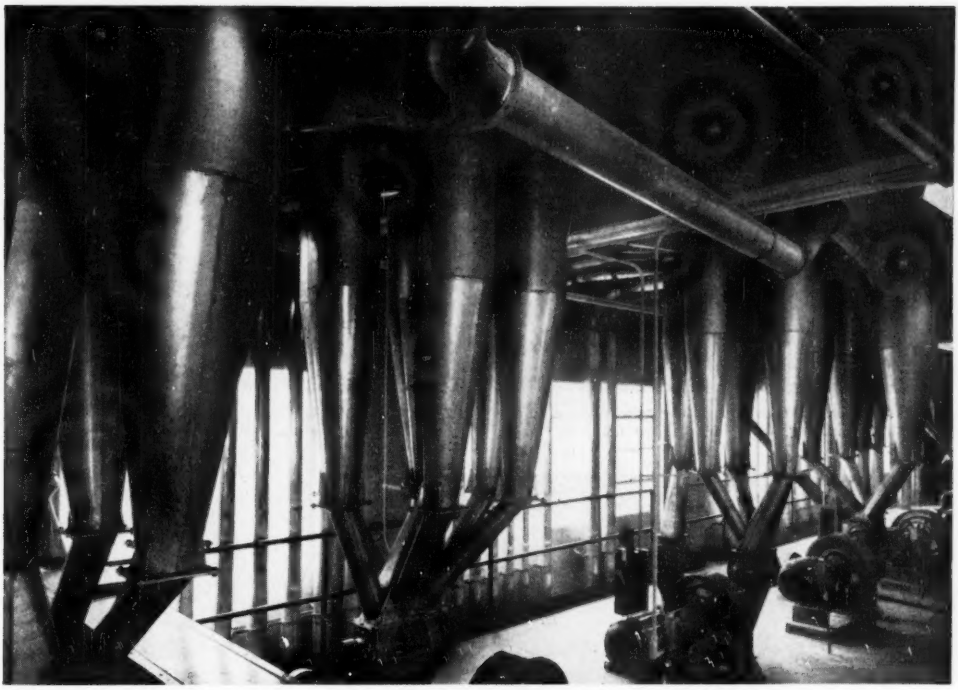
True, troubles were encountered in obtaining absorption oils that would not become gummy when moisture content became high, or which would not carbonize when heated above 250 deg. F. And it has been found that the plant operator must devote considerable time to maintaining proper flow rates and temperatures if this system is to be operated efficiently.

Despite this, efficiency of the vapor recovery is extremely good. When the system is balanced and running "in tune", it has been found to be approximately 96 percent.

TABLE—SOLVENT EXTRACTION With Trichlorethylene Gives Low-Fat Beef Cracklings

Run No.	Extraction Time, Min.	Drying Time, Min.	Miscella Gal.	Feed Crax. Moist. Percent	Feed Crax. Fat Percent	Extracted Crax.* Moist. Percent	Extracted Crax.* Fat Percent	Tallow Color FAC	Tallow Moist. Percent	Tallow Insol.
1	180	135	3425	2	33.6	5	1.6	19	....	....
2	180	120	3025	1	35.8	3	4.3	21	....	....
3	150	120	3400	2	38.0	8	2.5	19	1.25	0.25
4	180	135	3125	6	48.5	4	4.4	17	1.50	0.13
5	160	100	3325	4	32.2	4	2.7	....	....	....
6	150	90	3200	3	32.3	13	2.2	17	0.66	....
7	90	120	3025	1	38.5	12	3.5	21	1.70	....
Avg.	156	118	3210	3	37.0	7	3.0	19	1.28	0.19

* These figures compare with a 10–11 percent grease content in cracklings from continuous screw-pressing operation.



PIPES handling materials at new Los Angeles mill illustrate readiness to adopt better equipment and methods.

GENERAL MILLS' PROGRESS

Shows What Teamwork Means to Food Processor

Company clicks through all operations, from the selection of raw materials to the marketing and distribution of finished products, because it functions as a fully integrated unit

HARRY A. BULLIS
Chairman of the Board,
General Mills, Inc., Minneapolis

Some time ago, an article on General Mills stated in effect that research and diversification were the most important factors in the company's success.

No one in our organization would question that concept, but those of us who are acquainted with the company's operations would hasten to add that there are other important ingredients in a successful program.

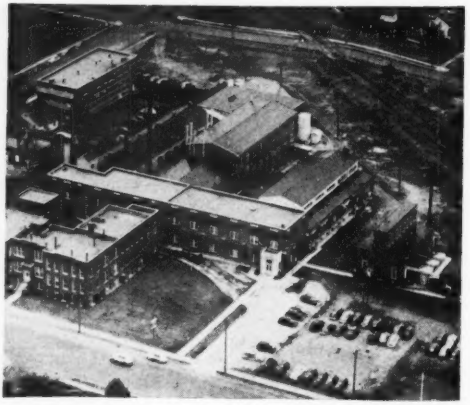
Research and diversification of themselves show that there has been in our company a full measure of vision and "carry through," without which success is short-lived. They do not reveal, however, the importance of the programs which have built consumer acceptance of our products. Nor do they tell of the team-work which makes the company click through all of its operations, from selection of raw material to distribution of finished goods.

To get a proper perspective we must go back at least to 1889. In that year our chief predecessor, Washburn Crosby Co., was organized with James S. Bell as its president. He brought with him many years of experience in flour merchandising. He believed that flour mills should be located between the wheat-growing areas and the centers of population. He saw the importance of strategic location in achieving maximum efficiency in operation and service, as well as in maintaining high quality of product.

Shortly after the turn of the century this idea was put into operation, and Washburn Crosby built a mill at Buffalo. This mill had the advantage of water transportation as well as access

Research Strides . . . Kitchen and Crocker . . . Workers and Owners

IN 1898 research at Washburn Crosby was confined to one floor of this building, with very limited facilities.

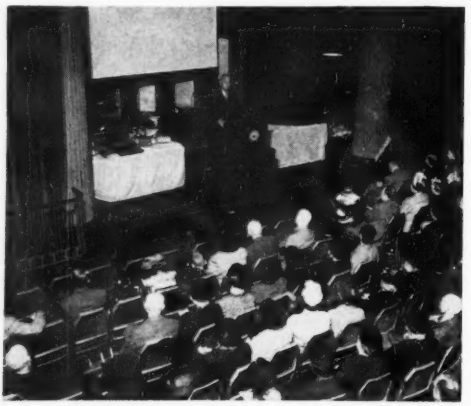


NOW GM research laboratories cover this wide area, occupying a staff of more than 300 technologists and technicians.

FIVE KITCHENS like this one—designated the Terrace Kitchen—keep the Betty Crocker staff busy checking and testing old and new products and recipes.

BETTY CROCKER'S portrait is familiar to most American homemakers.

EMPLOYEE courses in company operations provide opportunities for ambitious workers to advance in jobs.



AND STOCKHOLDERS are brought together with company officials for informal discussions of year's operations.

to the wheats of the central states and the prairie provinces of Canada. A plant at Louisville was then acquired to mill soft wheats for markets in the East and Southeast.

The same policy was carried on by Mr. Bell's successors. While John Crosby was president, mills were acquired in Kansas City and Chicago, and a packaged-food plant was built adjacent to the Chicago mill. So expansion was already in evidence when James F. Bell, son of James S. Bell, became president in 1925. He saw that his father's idea needed a larger framework if its full potential was to be realized.

He set about building such a framework, and in 1928 General Mills was formed, with James F. Bell as its first president. The new company started with the Washburn Crosby plants, together with certain mills and elevators in Kansas and Montana. Additional enterprises were added rapidly, including a feed company and the Sperry Flour Co.

By 1933 the outlines of the present structure were apparent, and the company was working out a flexible organization—with decentralized operations but centralized control of policies and services.

Expand Research

The slow but steady decline in the per capita consumption of wheat flour, which began before the turn of the century, had long been recognized. Mr. Bell was convinced that this trend would not be reversed. The general standard of living was rising. People were eating larger quantities of fruits, vegetables sugar, and meat, but they were eating less bread.

Therefore, if General Mills was to expand, it would have to be by adding new products. So a program of scientific research was organized to (1) find new products which would fit into the general plan, and to (2) improve the old products.

Mr. Bell has devoted the greater part of his energies to this program of research and diversification. He has seen the research staff grow from five cereal chemists in 1930 to a department employing more than 300 persons in 1950.

While the primary goal of the research program is to find new uses and better values for the products of the soil, there has also been aggressive research in the mechanical field. The new products developed by research and the improvements to old ones have added to sales volume over the years.

GM has become devoted to a program of research and expansion. We believe that national prosperity and full peacetime employment depend upon increased production. Scientific research helps to raise the standard of living by pointing the way to new and better products and more jobs.

The increase in sales volume from $123,000,000 in 1928-29 to $395,000,000 in 1949-50 was not all due to new products. Prices were rising, but there was also at work a well-integrated program of promotion with an aggressive sales organization behind it.

Betty Crocker Bows In

One of our greatest intangible assets is Betty Crocker. Inherited from Washburn Crosby, Betty Crocker had her origin back in 1921 when our advertising department decided that replies to housewives' inquiries about baking should be signed with a woman's name. So Betty Crocker was instituted. Or, as one writer put it, organized.

As the years passed, Betty Crocker acquired a well-defined personality, a portrait, and most important of all, the confidence and respect of the American housewife. Betty Crocker's first radio cooking school was conducted in 1924, and ever since then her program has been a favorite with American women. She has come to represent the personification of General Mills' service.

Thousands of letters come to her each week from homemakers seeking information. Each letter is answered individually in her name. Here test kitchens are in constant activity. Her opinions are relied upon, both within the company and among consumers. The recently published *Betty Crocker Picture Cook Book*• is already a national favorite.

But Betty Crocker is only one part of the company advertising program. Neither GM nor its direct ancestor was ever inclined to hide its light under a bushel. In 1890, Washburn Crosby spent $40,000 for advertising—a startling sum in those days. Today, General Mills spends many times that amount each year, but the expenditure is worth every penny. There is hardly a homemaker in the United States who does not know about Wheaties, Cheerios, Bisquick, the Betty Crocker Cake Mixes, and Gold Medal "Kitchen-tested" Enriched Flour.

Research can create a product. Promotion and advertising can introduce it to consumers. But it takes something more to win and hold the friendship of the trade and the customers. That is the job of the distributing organization backed by the people in plants and offices who are engaged in the various phases of purchasing, production, and services. The integration of all these functions brings about teamwork.

Long Service

Most of the persons on our top executive team are veterans in company service. Pres. Leslie N. Perrin joined Washburn Crosby in 1921, following my own entry by two years. Vice-Pres. Walter R. Barry, who is also president of the Food Division, came with Washburn Crosby in 1916, about the same time as Gerald S. Kennedy, vice-president in charge of production. Samuel C. Gale, vice-president in charge of advertising and public services, has been with us since 1921, and Arthur D. Hyde, vice-president, who is director of research and president of the mechanical division, joined General Mills in 1928.

I could list many more up and down the ranks, but these illustrate the fact that many of our executives have grown up with the company. They have worked together over the years and know the value of teamwork.

While it is the policy to promote from within, the door is not closed to outside talent and experience. When specialized abilities are needed and not readily available in the company we seek them elsewhere. Each year we try to recruit a number of competent young men who are not afraid of hard work. A fair proportion of these

7-Point Free-Economy Policy

"An industrial enterprise," says GM Board Chairman Bullis, author of this pointed article, "should be a 'good corporate citizen.' It should—

- **PRODUCE good products at reasonable prices.**
- **PAY employees fairly, and reward owners with adequate returns on investment.**
- **PLAN for progress through expansion, new products, new plants, and betterment of old facilities and products.**
- **BE A PART of each community in which it operates plants and offices.**
- **KEEP employees informed about company affairs and encourage them to take part in civic projects.**
- **STRIVE to be considered a good place to work.**
- **TELL stockholders about its activities and the public about policies, products, and plants."**

• Published through McGraw-Hill Book Co.

develop administrative ability, and as a result there is generally a trained man ready when an executive replacement is needed.

As the result of teamwork, quality products, and sound programs, General Mills has had sufficient earnings so that considerable amounts could be reinvested in new plants and in modernizing old ones. Since the company was formed, we have plowed back over $43,000,000, and we have furnished new jobs for several thousand persons. We are happy that we have continued to grow and that we have been able to provide higher wages and greater benefits for our men and women. There is a constant challenge to find better equipment and methods to help increase output per employee, which is a big factor in continued success.

We believe that our men and women, with the integrity, experience and "know how" which they represent, are the company's most valuable asset. We want to do everything possible to make their jobs stable, give them opportunity to advance, and provide reasonable security. We have a retirement system, a health association, training courses, safety programs, and other activities for the welfare of our employees. We want our company to be a good place to work.

Inter-Company Relations

The growth of the country's corporations is responsible for the development of what we have come to call human relations in industry. Less than 100 years ago the average business was small, and it was usually owned by one man or a small group. The office was usually in the shop or mill. The business was managed by the owner, and he knew personally the men who worked for him—knew their faults, their special abilities, and the members of their families.

Many of these small businesses prospered and grew. Some became large corporations, and today face a very different situation. As an example, the ownership of our company is divided among 13,000 shareholders living in every state of the Union, and we have over 12,000 employees. Management's contacts with employees and owners constituted no problem in the early days; today, they are a most important consideration.

While individuals differ a great deal, they have many points of similarity. We can be quite sure that every man on the payroll has personal aspirations. He wants to get ahead, he wants reasonable assurance of security for himself and his family, and he wants recognition as an individual and as a part of the organization.

Good wages or a reasonable salary go a long way in satisfying some of these aspirations. In some cases, we find a strong desire for advancement; but actually only a small percentage of workers are willing to assume the responsibilities that go with advancement. For those who are willing, however, it is vital that we provide the opportunity, and it is equally vital that we keep our employees constantly aware that opportunity exists. The man who really wants opportunity will make the most of it. But if opportunity is hidden from an ambitious man, he will either leave for greener fields or become a troublemaker or an advocate of some "ism" parading under the guise of social reform.

JAMES F. BELL, General Mills founder, is seen at left with the author and Leslie N. Perrin, company president.

It is equally important that the larger group—those who do not want to become leaders—also have opportunity for improvement. If they are to be content to continue in the ranks, they still must feel that they, too, have a future in the business. They must be made to realize that their individual success is directly related to the success of the business which employs them.

All-Around Security

It is important that we all realize that employee security depends upon the security of the company. Also management, in particular, should recognize the important fact that if a business fails to provide reasonable security, the employees will look to government for that security. There are limits beyond which business cannot go in providing for security of employees, but in general, it can do more than it has been doing.

All persons want recognition as individuals and as members of the team. They want to feel that they "belong." Without this feeling there is frustration and restlessness which cannot be eliminated by granting demands for shorter hours and higher wages. One of the best ways to increase the employees' feelings of participation is to lower the barrier between management and the rank and file. This can best be done through the foreman or first-line supervisors who have day-to-day contact with the men. To the workers, the foreman is management.

Management should give a great deal of attention to the selection of foremen and supervisors. An employee gets his first and perhaps most lasting impression of the company through his supervisor during his first few days on the job. The attitude and understanding of the foreman is a vital factor in the wholesome relationships between employee and management. Supervisors can make or break a program of human relations.

Most employees are interested in their company. They want to know what is going on. Management should give them the financial story in a way that they can understand. We should tell them how the rate of production has affected earnings, how much of the sales dollar was paid out for raw materials, how much for employee wages, salaries, and benefits, and how much for other costs. We should tell them how much went to stockholders and how much was spent for improvements and new plants which create new jobs.

Many people believe that large profits reported by a large corporation mean that there has been a large return on the investment. We can help correct this misconception by giving our

employees the facts regarding profits and what is done with them. Employees should understand that profit dollars are the same kind of dollars as wage dollars, and that each profit dollar today buys only half as much as a prewar profit dollar.

I am confident that if we in management trust and respect our employees they, in turn, will trust and respect the company. Mutual confidence is the essence of teamwork up and down the line.

Stockholders are the same kind of human beings as the rest of us. Our own 13,000 are in all walks of life—doctors, teachers, businessmen and women, industrial workers, employees, and retired persons. Between 40 percent and 50 percent are women.

Lewis Gilbert of New York, an ardent campaigner for the rights of the small stockholder, says that stockholders want to be treated as owners and partners in the enterprise and not merely as names on a stock ledger. Progressive management wants to have stockholders take an active interest in their company. Yet, many stockholders are apathetic. It is up to management to find ways of stimulating their interest.

Attractive and informative annual reports, dividend inserts, and stockholder magazines are excellent, as far as they go. But printed matter can never do a job as well as personal contact. That is why our founder, James F. Bell, when he was chairman of the board, pioneered the idea of informal regional meetings with stock-

(*Turn to page* 169)

9 New Wrappers Offered

Coming in a wide variety, they have been specially designed to aid processors in turning out more protective, efficient, and salesworthy packages

ROBERT de S. COUCH

Head, Packaging Research, General Foods Corp., Hoboken, N. J.

Development of new packaging materials proceeds at an ever-increasing rate. In fact, it's often true that evaluation of one new wrapper is hardly well underway before another one appears that might take its place.

Further, this tempo has been accelerated by the never-ending modification of existing materials to provide new properties.

To bring the picture up to date on the more recent highly-promising packaging materials, nine new wrappers command attention:

1. The first is "Sara Pak 1", which is made by H. P. Smith Paper Co. It is a saran-coated kraft paper with interesting characteristics. Initial evaluation tests indicate that this material has most of the desirable properties of saran film, without the need of special packaging and sealing equipment. Properties built into the film depend upon the weight of paper and thickness of saran.

The material is an excellent grease barrier and, for a coated kraft paper, its moisture transmission rate is extremely low. The strength of the sheet is good, and it can be varied by changing the weight of the paper and coating.

2. Another combination sheet produced by H. P. Smith is a lamination of polyethylene-coated aluminum foil and scrim—a material currently being used for some Quartermaster-ration packages. This sheet should perform well where a moldable wrap is desired.

3. The "Hi-Gloss" Snopaque glassine-foil lamination offered by Riegel Paper Corp. is a good example of a novel combination of old standbys. In addition, its coating is new and its gloss is an improvement over the older types used for moisture resistance and heat sealing. The lamination provides an excellent appearance and good moisture protection.

The foil provides the moisture barrier in this sheet, the coating on the glassine not being of the moisture-resistant variety. The lamination is a water-phase adhesive.

4. Another new material—one still in the experimental stage—is Riegel's combination of pouch stock laminated to aluminum foil that has been coated with polyethylene. Since it is only coated on one side, it cannot be handled by all machines. It is to be used where a face-to-face seal is made.

This material should run satisfactorily on such machines as the Transwrap, Stokeswrap, Pneumatic, Bartelt and Simplex fin-seal envelope forming unit. Employment of the sheet is indicated for packaging products requiring a high degree of moisture protection.

5. The Benj. C. Betner Co. is producing the new "Bencoseal" series of laminated wrappers. One sheet is a lamination of the following five materials: Foil, wax, tissue, wax, and tissue.

6. In addition to this foil variety of laminated film, the new Betner series includes all-paper wrappers that can be put together in almost a dozen combinations, depending upon the characteristics desired in the finished sheet. Provided is good moisture protection, and the strength of the seal is excellent. The lamination usually consists of microcrystalline wax and other materials capable of providing a very tacky seal. A tissue is laid over the wax to prevent blocking. This helps increase the strength of the bond when a seal is made.

If the moisture-resistance requirements of the package are moderate, the combination may consist of a dense kraft paper, wax, and tissue. Glassine may be used in place of kraft if strength is not important. A high degree of moisture resistance can be obtained by adding another layer of wax.

7. Film 190, a cellophane-polyethylene combination manufactured by Standard Cap & Seal Corp., has this unique feature: The cellophane has been stabilized to eliminate the possibility of delamination. This material is being used to vacuum-package fresh meats and other products.

8. Kalamazoo Vegetable Parchment Co. has developed a silicone-treated parchment with interesting non-sticking properties. This so-called "releasing" paper can be used for such products as Brown 'n Serve type rolls and cakes, also for baking macaroons.

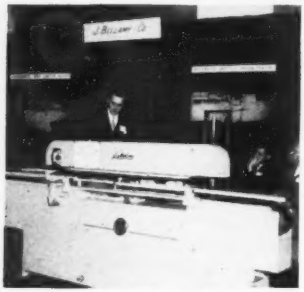
9. Finally, there is "Tyton Tite", produced by Marathon Corp. It is a locker paper providing very good moisture protection at low temperatures. The sheet is a lamination of two specially plasticized kraft papers, with coating on one side. Placement of the coated side next to the meat makes subsequent removal of the wrap easy. The coating is hard, glossy, scuff-resistant, non-blocking, and flexible at low temperatures. The wax laminate is specially designed for low temperatures.

The above article is based on a paper presented by the author at the recent Packaging Conference of the American Management Assn. in Atlantic City, N. J.

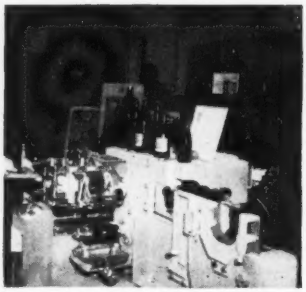
CAMERA REPORTS WHAT'S

Latest Fillers, Labelers, and Wrappers Snapped

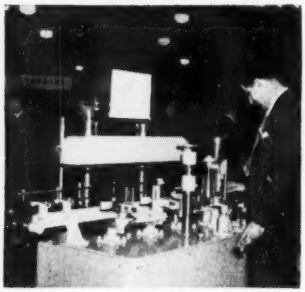
Specially Designed Labelers



SPOT LABELER, designed by J. B. Bellamy & Co., San Francisco, either applies glue to labels, activates thermoplastic ones, or both. Handles 120 per min. (1 oz. to 1 qt. containers) or 50 per min. (½ gal. to 1-gal. jars). Continuous-action unit features spill-proof design, vertical glue roll that can be covered during off-periods, and two wiping stations.

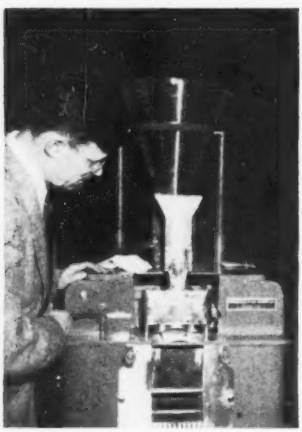


GLUE LABELER, for handling 2 to 4-in. dia. bottles at 170 per min., shown for first time in U. S. by Morgan Fairest Ltd., Sheffield, England. Rubber rolls put glue on sides of U-plate, and label is applied to this plate, picking up glue on ends only. Then label is pushed off by metal fingers onto vacuum holder, and bottle picks up label in a rolling motion.

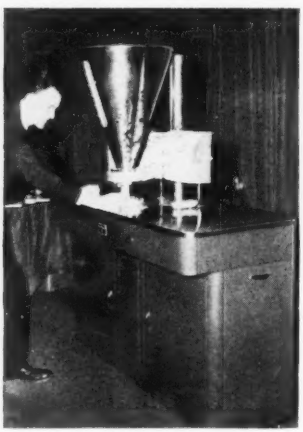


STRAIGHT-THROUGH labeler, displayed by MRM Co., Inc., Brooklyn, applies glue or thermoplastic labels to cans or jars 1 to 13 in. high at rate of 75 to 150 per min. Vacuum arm picks label from magazine, then special clamps transfer label across glue roller. Label is then lined up with container while latter is in motion. Jar or can goes to two rubber wipers.

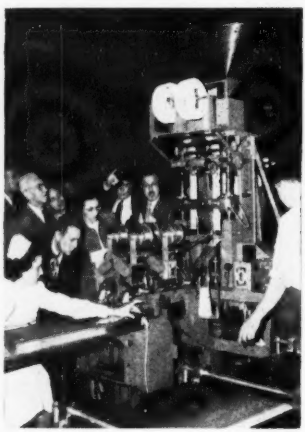
Newest Filling Equipment



PACKETING MACHINE, exhibited by Brown Bag Filling Machine Co., Inc., Fitchburg, Mass., makes envelopes from a roll of any heat-sealable paper. Unit is equipped with vibratory, volumetric filler that measures product in 3g.-to-2½-oz. range within 1 percent accuracy at speed of 50 packets or envelopes per minute.



VACUUM FILLER, designed by Packaging Industries, Inc., Montclair, N. J., fills all types of containers with free and non-free flowing powders in range from fraction of an ounce to 25-lb. Rate: 20-22 per min. Machine operates under 15-25 in. of vacuum. It is quickly adjustable to handle a large variety (size and shape) of containers.

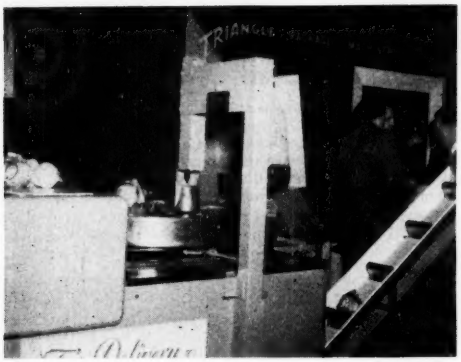


STOKESWRAP machine for packaging 120 tea bags per minute, and tagging them at same time. Shown by Stokes & Smith Co., Philadelphia, this new unit automatically forms, fills, seals, and applies tags to individual tea packets. Bags are formed from a special tea-bag paper. Stacks of tea bags are then packed in cartons.

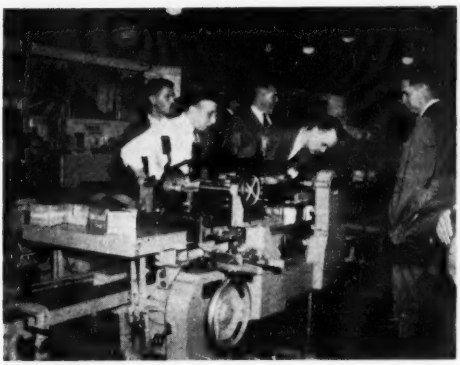
NEW AT PACKAGING SHOW

Also Carton-Formers, Imprinters, and Casers

Novel Wrapping Machines

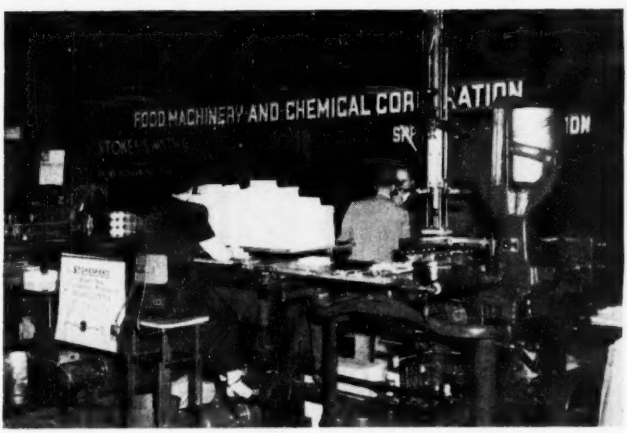


PREPACKAGING of meats and produce without need of a boat, tray, or liner is attained at speed of 30 packages a minute by Form-a-Wrap unit. Displayed by Triangle Package Machinery Co., Chicago, machine automatically forms a tight, heat-sealed contour wrapping from a roll of cellophane or other transparent film.

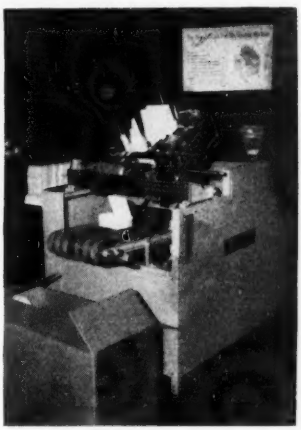


CARTON-WRAPPER shown by Package Machinery Co., Springfield, Mass., is designed to handle polyethylene, saran, Pliofilm, and other films. Featured are static eliminator to prevent curling of film, Teflon-coated bottom film folder and sealer, and special chain-slot conveyor with Teflon between flights. Speed: About 60 packages a minute.

Speedy Carton-Formers



PAPER BOX machine, presented by Stokes & Smith Co., Philadelphia, automatically sets up 40 boxes per minute. Operator "registers" box blank on a glued wrap as it is delivered on conveyor. Unit is readily adjustable for handling various size cartons.

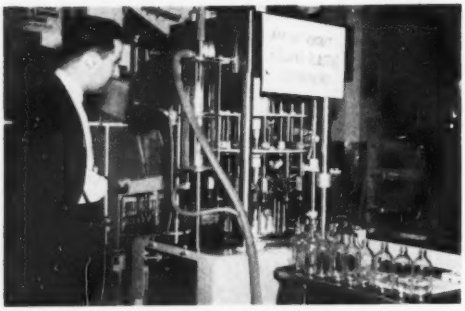


THIS BOX FORMER requires no glue or forms. Blanks are coated with new adhesive. Maker: International Paper Box Machine Co., Nashua, N. H.

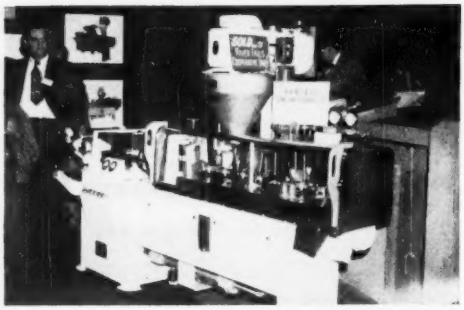
For more information about any item in this article, use Reader Service coupon (adjacent to inside back cover).

Turn Page for More New Units ⟶

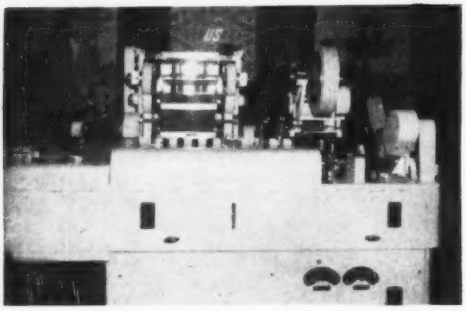
Liquid and powder fillers . . . Carton-filler, Bag-closer . . . Imprinters



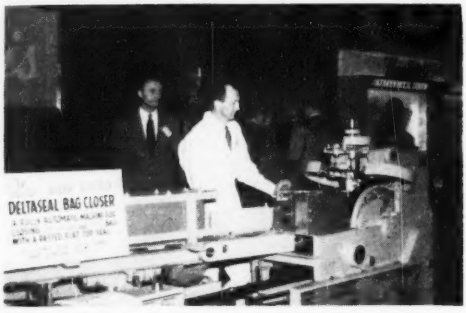
ROTARY liquid filler (MRM Co., Inc., Brooklyn, N. Y.) is designed to avoid contamination and corrosion. It features a removable reservoir tank and contact parts of stainless steel. All operational equipment is also overhead, permitting ample open areas below for cleaning. Machine is furnished with 12 to 40 spouts. It can be quickly adjusted to fill containers of varied sizes and shapes, from ½ oz. to 1 gal.



BAGGING of powders in almost any type of film within a nitrogen chamber at rate of 75 packages per minute is possible with this machine. Bags are made from a roll and then fed to gas-tight chamber, where vacuum fingers pull them open for gravity filling. Bags continue to heat-sealer, then are discharged through flap chute. Maker, Bartelt Engineering Co., Rockport, Ill., also furnishes unit without gas-tight chamber for packaging liquid products.



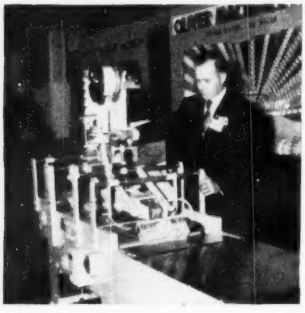
VOLUMETRIC FILLER, displayed by U. S. Automatic Box Machinery Co., Inc., Boston, packages wide variety of candies at 60 cartons per minute. It picks up flat carton, opens it, tucks bottom flaps, cuts, forms and inserts liner in carton, then fills and tucks flaps.



FULLY automatic bag-closing machine that closes and seals Delta seal-paper and cellophane bags at speeds up to 75 per min. was presented by Bemis Bro. Bag Co., Minneapolis. Bags are closed with pasted, flat-top seal and are used for sugar, corn meal, rice, and flour.

MARKER, actuated by movement of containers along conveyor, codes tops of cans or glass jars at speed of 600 per min. Cans on line rotate pair of starwheels, which actuate stamping wheel and ink-metering pump. Barry-Wehmiller Machinery Co., St. Louis, is maker.

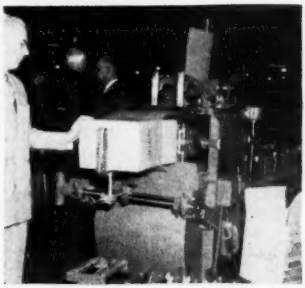
CONTENTS information and code dates are printed by Rolacoder on small cartons as they travel along a conveyor. Cam on drive wheel synchronizes shaft to position cartons for either ½, 1/3, or 1/5 rotation. Exhibitor: Adolph Gottscho, Inc., Hillside, N. J.



TOP-OF-BOX CODER places roll-type, thermoplastic label on any square or rectangular-shaped package. It is used with box set-up unit, or wrapping unit lacking preset paper cut-off. Exhibitor: Oliver Machinery Co., Grand Rapids, Mich. Coder can also be placed on packaging conveyor lines.

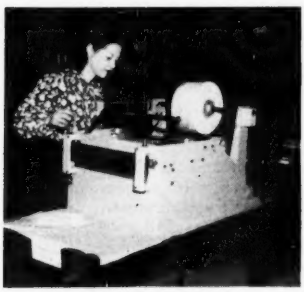
Case units . . . Bag-formers . . . Handling devices

AUTOMATIC case opener and sealer picks end-flap shipping cases from magazine, sets them up, pushes packages in, then glues and seals. Unit is made by Schroeder Machines Corp., Syracuse, N. Y.



NON-SHOCK caser loads 20 per min. with maximum protection against damage to cans, labels, and product. Food Machinery & Chemical Corp., Hoopeston, Ill., designed unit to handle fragile products and containers.

PRINTING of five sides of formed and sealed shipping cases is handled by Markoprinter, displayed by Adolph Gottscho, Inc., Hillside, N. J. Machine eliminates need for large stocks of preprinted cases, saves space.

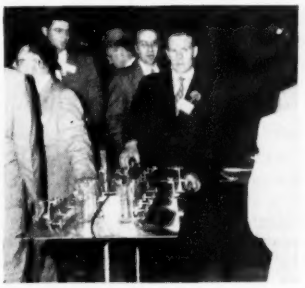


POLYETHYLENE bag-forming unit that turns out 2,000 bags per hour—displayed by Hilker Products Corp., New York City. Sealing is by radiant-heat beam, directed at exact spot for seal. Featured is high frequency, high voltage static eliminator, driven by an electronic pulse generator.

HEAT-SEAL bag-maker, exhibited by Roto Bag Machine Corp., N. Y. C., handles polyethylene and Pliofilm sheeting and tubing. Unit flat-seals bags in wide range of sizes, at speeds based on film gage rather than size. Included with unit are static eliminator, counter and stacker.

BAG-FORMER, specially designed by P-N-R Corp., Cleveland, to handle polyethylene and other thermoplastic films, produces 40 bags per minute. Called the Oto-Pak, this unit can be adjusted during operation to run at different speeds and to make varying size bags. Features splash-lubricator.

THIS CARGO LOADING system has been turned out in test form by Island Equipment Corp. (Long Island City, N. Y.) which seeks to determine if there is a market for it. Unit (see photo) consists of two rows of aluminum rollers set in an aluminum frame flush with diamond-plate sections. Installed on floor of truck, loader can be elevated by jack or hydraulic ram for positioning full pallets.



TWO-LANE DIVIDER, also presented by Island Equipment Corp., Long Island City, feeds one line of containers into two rows, which then go to filler, capper, or labeler. Unit has a selinoid kicker that alternately feeds jars from one to two lanes. It was specially developed to divert containers (coming from high-speed filling machines) to two labelers operating at half capacity.

HORIZONTAL elevating conveyor displayed by Counsel Machine Co., Wallington, N. J. It eliminates scoop-action commonly employed in delivering a wide variety of products to production lines. Unit has stainless steel supply hopper, vibratory feed chute, "no-spill" buckets with rounded corners, and delivery chute. Done away with is waste from spilling, also damage from rough handling.

WITH a capacity of 300 24-can cartons, this type truck maintains a twice-a-week plant-to-outlet schedule, holding dairy product at 33 to 38 deg. F.

Refrigerated Trucks Speed Canned-Whip to Market

Small, trim vehicles provide ample protection for pressure-can whipped cream during direct distribution from processor to retail store

SMALL, SPEEDY delivery trucks equipped with mechanically refrigerated bodies have made possible the efficient distribution through retail store outlets of another perishable food-fresh whipped cream.

Labeled Reddi-wip, the product is distributed in a metal container holding 7 fluid ounces of fresh sweet cream, sugar, vanilla, stabilizer and nitrous oxide. By shaking just before using, the nitrous oxide action provides pressure, producing whipped cream on release of the product from the container.

Temperature control, from the time of plant manufacture to removal from the housewife's refrigerator just prior to serving, is the best protection against spoilage. The desired product temperature range over the period from processing to use is from 33 to 38 deg. F. for the product to keep indefinitely. However, temperatures of up to 50 deg. F. will keep the product fresh and sweet for a long period of time.

With proper protection at the Reddi-wip processing plant, and assuming the same in the average home, then adequate refrigeration must be provided while the product is being distributed from the processing plant to the retail store and while it remains unsold on the grocer's shelves.

For distribution from plant to retail store, the Reddi-wip Mfg. Co., Inc., of New York employs a fleet of 25 International step-in drive trucks with insulated and refrigerated bodies capable of maintaining a product temperature range of between 33 and 50 deg. F.

Started Last September

The first of the Reddi-wip trucks went into service in September, 1950. All of the trucks are factory-assembled refrigerated models in which both chassis and insulated and refrigerated body come as a complete package unit ready to go to work without the services of any outside body builder.

Each of the trucks has a fully-insulated body 12 ft. long with 256.4 cu. ft. of refrigerated space. Six inch thickness of Fiberglas insulation is provided all around—ends, sides, floor, roof.

The refrigeration unit is a separate package unit installed inside the body at the left front corner directly in back of the driver's seat. Taking up about 4 sq. ft. of the body floor area, the unit is mounted on a separate frame so that it can be removed for repairs and reinstalled without any structural or body changes. The only connections between it and the truck chassis and body are the body fastening bolts and the hookups to the truck's gasoline tank and electrical system.

The refrigerating unit uses Freon and is self-contained, consisting of a small four-cylinder water-cooled gasoline engine, a four-cylinder compressor with forced-feed lubrication, and a blower-type evaporator.

Interior body temperatures are controlled automatically by means of an adjustable thermostat which is set to the desired temperature and keeps the unit operating until that temperature has been reached. It then shuts down automatically, staying off until a rise in the temperature again activates it.

Controlled Temp

Access to the truck's refrigerated compartment is through a 34-in. door at the rear and a 26-in. door at the front and to the right of the driver. In operation, the Reddi-wip cartons are loaded through the rear and unloaded through the right or curb-side sliding door which encloses one end of the driver's compartment.

Maintenance of the desired inside body temperature requires that all body leaks be eliminated, and to this end all of the trucks are made both air- and water-tight. All the body seams are overlapped and all joints are closed with a permanent sealer and securely fastened with metal screws.

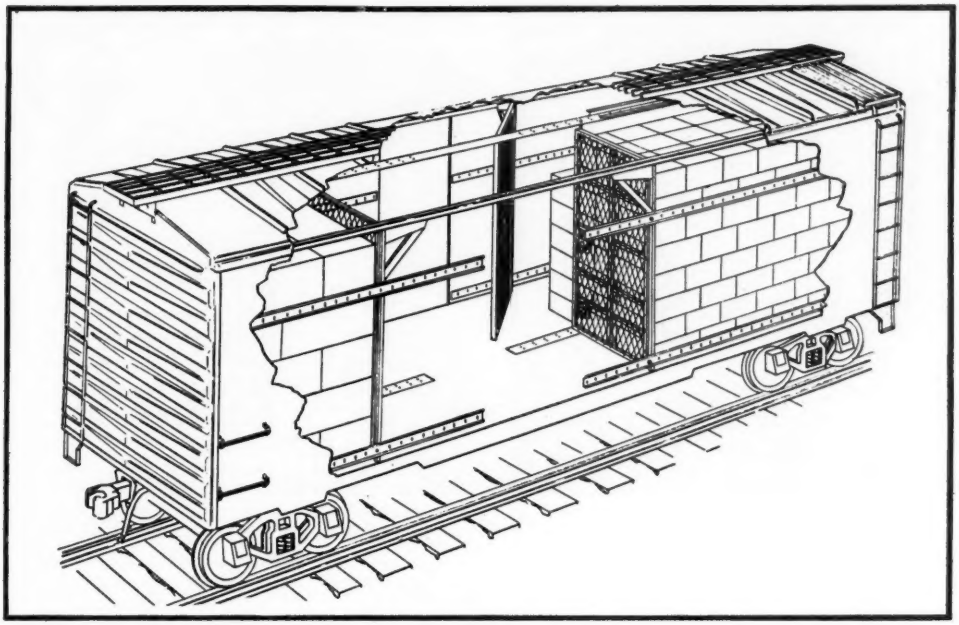
Display Details

Both side panels of the trucks are utilized for name and product advertising through the medium of Palm-Fechtler decalcomanias. The trade name—a quoted "Reddi-wip" as used on the product container and in all newspaper and magazine advertising—is reproduced on each truck panel in a medium purple color with the dot above each "i" in a bright red color. Each decal also includes a color reproduction of the product container with its own Reddi-wip name lettering shown prominently.

The step-in type of the truck, with its relatively large load-carrying capacity on a short wheel-base length, enables the driver to get in and out quickly and thereby speed his deliveries.

Taken all in all, the system is an excellent example of how a food processor has adapted the modern refrigerated delivery truck to his own specific distribution needs—taking fullest advantage, meanwhile, of its advertising possibilities.

NEW EQUIPMENT & SUPPLIES



Freight Car Device Protects Goods, Curbs Load Shifts

Damage to goods in transit is minimized with use of a new freight car bulkheading device which prevents the shifting of loads.

Called a Compartmentizer, it consists of adjustable steel gates—two or more pairs to a freight car—which are locked in place at ceiling, wall and floor. Gates can be placed in service position at 3-in. intervals to divide the car into three or more compartments. Number of freight compartments in any car will depend on how many gates are installed.

Adaptable to existing as well as new railroad box and refrigerator cars, the device has been designed so that the steel gates, when not in use, may be stored in a small space at either end of the car. Thus there is no need of designating the cars "special purpose."

Hanging from a trolley running the full length of the car, each gate remains in a vertical position, whether it is closed, partially open, or in an open position folded against the end wall.

The unit differs from most load retaining devices in that there are no loose parts requiring removal or installation. Thus, company engineers point out, substantial savings are possible in loading labor costs. Possibility of injury to employees and damage to lading by unsecured parts also is eliminated.

Company further states that device will aid the railroad in meeting competition by freeing shipper of dunnage expense.

Brief of advantages reported by designers: (1) It provides sealed compartments for partial shipments and reduces possibility of loss of lading by theft; (2) there are no loose parts to remove, install, or lose; (3) more rapid loading and unloading of cars, resulting in more efficient car use; (4) during loading and unloading, gates may be folded out of way against sidewalls so as not to interfere with freight-handling equipment; and (5) one man can easily move gates to any desired position in car and lock them in place. —*Pullman-Standard Car Mfg. Co., 79 East Adams St., Chicago 3.*

Platform Beam Scale For Heavy-Duty Use

Fast, accurate, low-cost industrial weighing is reported with use of this new platform beam scale.

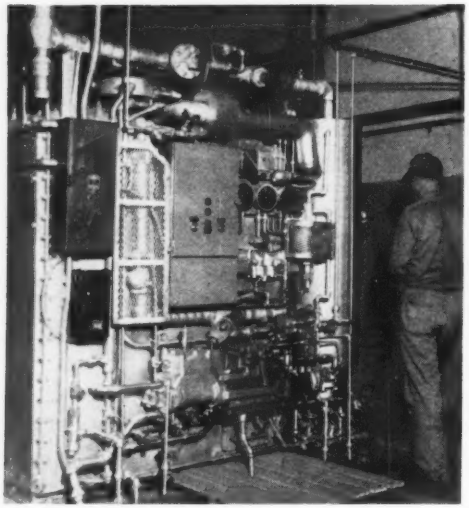
Called the Load King, the unit is designed primarily for heavy duty industrial applications where "shock-loading" is the rule. The lever system in the platform is all-steel, as are other key parts. No wood is used.

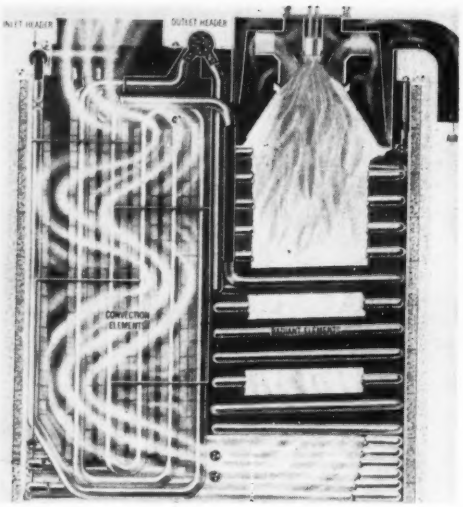
Poises on the main bar are mounted on roller bearings for rapid positioning. Another feature of the scale is a 100 percent end-loading platform that gives the same reading regardless of the location of load. This platform, which is mounted on outboard bearings, also absorbs the shock of moving loads without damage to scale. It will not tip.

Pit for scale requires only an 11-in. excavation, saving considerable expenditure when the unit is installed.

Available in self-contained and semi-self-contained models, the new machine is built in capacities up to 6,400 lb. Platforms range from 46x38 in. to 76x54 in.—*The Yale & Towne Mfg. Co., Roosevelt Blvd., Philadelphia.*

Re-Circulation Steam Generator Is Compact





Newly announced is a compact steam plant culminating a five-year period of research, development and operation experience.

Known as the "C-E Re-circulation Steam Generator," it is a complete steam plant which includes feedwater pump and control, fuel equipment and control, combustion control and safety devices, forced-draft fan, safety valves, circulating pump and all other auxiliaries. Unit may be fired by light or heavy fuel oil or by natural gas. It is available in several sizes for steam capacities from 2,800 up to 6,000 lb. per hr. and for operating pressures up to 300 psig.

Generator was originally developed for train heating service. In the modern diesel-electric locomotive there are limitations on weight, space, and power requirements for steam generation. Furthermore, unit must have automatic operation, and ability to use feedwater of varying quality. Extensive investigation showed that controlled re-circulation would meet these requirements. And laboratory tests indicated its effectiveness in reducing scale formation.

Following successful development and application to train-heating, the possibilities of the generator in industrial fields were investigated. It was concluded that various special features of unit made it widely applicable in food plants.

Initial applications in industrial plants were made early in 1950. Most notable feature of generator is its compactness. The 6,000-lb.-capacity unit for burning light oil or gas occupies a space 6-ft. 11-in. long x 5-ft. 5-in. wide x 6 ft. 11-in. high, and the heavy oil burning unit is only slightly larger.

Another distinguishing feature is use of the controlled re-circulation principle. High rate of heat transfer made possible by use of this principle permits maximum steam production per unit of heating surface and thus makes possible maximum steam output per unit of space and weight. Controlled re-circulation assures positive circulation throughout all heating surfaces, minimizes scale formation, and thus is achieving a higher operating efficiency.

Generator Components

Principal parts of the generator comprise the heating elements, operating motor, feedwater pump, feedwater regulator, circulating pump, burner, fuel oil pump and air blower. Heating surface consists of a number of radiant and convection elements within a paneled steel casing. Each element is connected both to inlet and outlet header. An orifice at the inlet end controls flow of water to the element.

Outlet header is connected with a vertical drum called a separator. Top part of the separator has a circular passage for steam and water coming from outlet header at high velocity. Centrifugal force throws water to outside of passage, where it is carried to a vertical passage leading to lower part of drum and to circulating pump. Steam is separated from water and flows to outside steam line.

Driven by a constant-speed electric motor, circulation pump, forces water, at a velocity above rate at which scale forms, into inlet header and then through heating elements to outlet header.

Two burners are provided to give maximum combustion flexibility. For starting, a small "all-on" or "all-off" electrically-ignited burner is operated by a pressure limit switch. It is limited to a steam demand of 700 lb. per hr, after which a larger burner is cut in and operated up to maximum rating. At medium and heavier loads, both burners are in operation. Fuel oil and air to larger burner are adjusted by combustion control in accordance with load demands. Arrangement may be varied slightly to burn heavy fuel oil or gas.

Air for combustion is supplied by a blower and regulated by a damper that is controlled by pressure of fuel oil. Fuel oil pressure, in turn, is controlled by steam pressure.

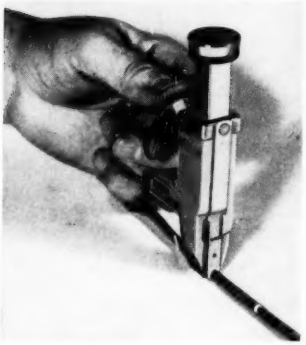
Feedwater pump, automatically controlled by a float system in separator drum, pumps feedwater to a closed heat exchanger, where it is preheated by the heat of exhaust steam. Preheated feedwater then enters outlet header and steam separator, where it is deaerated.—*Combustion Engineering-Superheater, Inc., 200 Madison Ave., New York City, 16.*

Corrosive Inhibitant Is Non-Toxic

To meet government specifications on manufacture of food handling equipment, a new, non-toxic corrosion inhibitant has been developed.

Designated as Industrial Wax W-6119, the corrosion preventive was especially formulated to meet Defense Department Specification Mil-C-10382. It is reported to give the needed protection to many types of food handling equipment, including utensils, stoves, refrigerators, immerson heaters, and baking ovens.

It can be applied by conventional dips, spray or brush methods to all types of metals. When removal is necessary, a standard vapor degreasing operation is used—*S. C. Johnson & Son, Inc., Racine, Wis.*



Tiny Tacker Cuts Wiring Costs

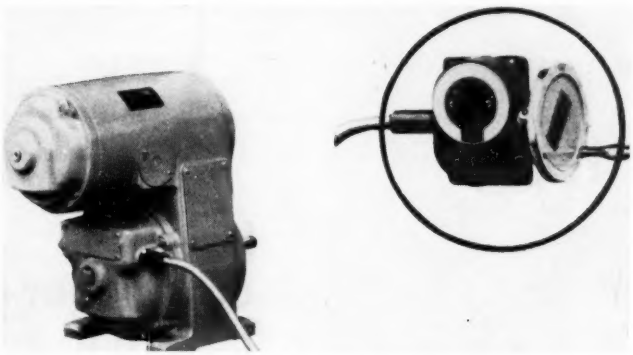
This new pocket-size tool was developed to effect savings of time and money when making wire installations.

Tacker speedily staples braided, rubber-coated, single and double strand wire, and hollow tube lines. Front and rear guides circle the wire and permit rapid drawing around difficult angles or corners, along baseboards, plaster walls, window frames, ceilings, door jambs and rafters.

It uses an improved staple, made in several colors, whose driving points easily penetrate plaster, composition board, hard and soft woods (with holding power up to 64 lb.). Staple is driven to desired depth without marring or injuring the wire.

Designed to exacting A. T. & T. specifications, both tacker and staples are now used for low voltage telephone wiring throughout the Bell System.—*The Heller Co., 2153-N Superior Ave., Cleveland* 14.

Device Provides Operator With Handy Speed Control



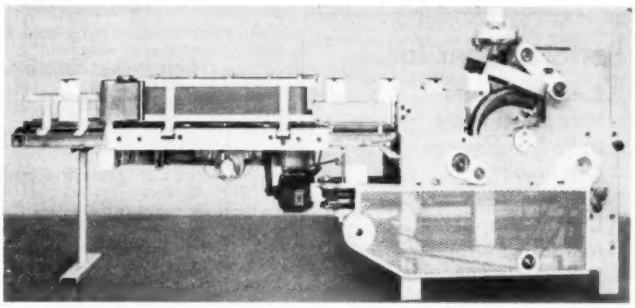
This new, improved mechanical remote control is designed so that it can also be adapted to any Speed-Trol now in use.

Control is available in a variety of types, with extended flexible cable (as illustrated), or with an extended rod with universal joint, right angle bevel gear with extended rod, chain and sprocket, or a combination of any or all of the above. A remotely located speed indicator with handwheel is also available.

Unit permits variable speed drives to be more adaptable on more applications where remote control is necessary. The device has been designed so that operator will always have the handwheel control at his fingertips, affording greater usage of the infinite variable speeds and a steady flow of power at any selected speed, even under fluctuating load conditions.

Speed-Trol electric drives come in sizes from ½ to 25 hp. inclusive and are available with 2:1, 3:1, or 4:1 speed variations in a range of speeds from 2,000 rpm. down to 26 rpm.—*Sterling Electric Motors, Inc., Los Angeles* 22.

Machine Closes Both Cellophane and Kraft Bags

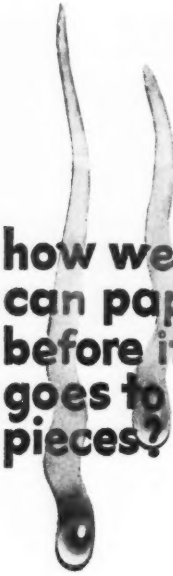


This new closing machine is designed for the versatile job of closing both filled cellophane bags in 1-, 2-, and 3-lb. weights and 2- and 3-lb. kraft paper bags. The bags used have the handy pour-spout known as the Deltaseal closure.

Complete unit requires only a small amount of floor space. Entirely automatic, it consists of a shaker for settling the contents tightly and uniformly in the package; the closing unit; and a conveyor that allows for drying time and transporting of the bags from the closing unit to the casing station.

The adhesives used are stated to insure tight closures, whether package is constructed of plain type or moisture-proof cellophane. If heat sealing is desired, an additional heated-belt may be obtained on which the packages travel under pressure.

Machine may be adjusted to handle different size packages in from 30 to 60 min., depending on skill of operator. Units now being used are closing 60 to 70 bags per minute.—*Bemis Bros. Bag Co., St. Louis* 2, *Mo.*



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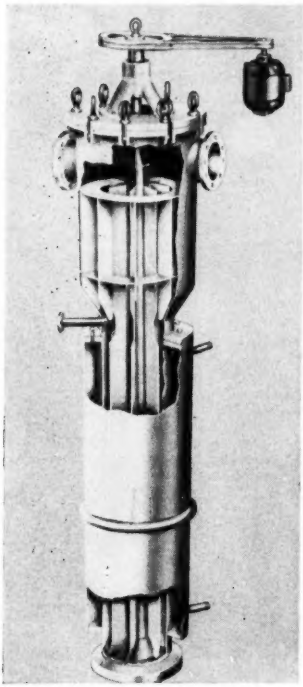
Thin-Film Evaporator Concentrates In Single Pass



Improved product quality of citrus and other juices, milk, sugar solutions, and other foods, is claimed for a novel line of evaporators employing the Swiss (Luwa process) principle of concentration from a turbulent thin film.

Called the Turba-Film evaporator, it is stated to concentrate continuously in a single pass, requiring only seconds. Goal of the rapid concentration at minimum temperatures is a finished product of higher qualities.

Evaporator proper comprises a vertical tube, the lower portion being surrounded by a heating jacket to warm the concentrating surface. Upper part of tube is enlarged to assist in "knocking out" any droplets entrained in vapors. A rotor is fitted coaxially over almost the entire length of tube, and its extended blades reach within about $\frac{1}{32}$ in. of the heated wall in order to maintain a turbulent, thin film.

In separator (upper) zone, centrifugal action of blades throws any entrained droplets to fins that arrest their circular motion, thereby permitting separated material to fall back into the heating zone for evaporation.

Froth which may be carried up with hot vapors is projected against walls of the separator portion of machine by action of the blades, and intermediate deflectors cause it to run back into concentrating zone. Aim is to handle, in an efficient manner, liquids with large amounts of foam. Losses of materials being processed are reported minimized.

Liquid to be concentrated enters at inlet (left side in illustration) and is immediately picked up by rotating blades, which throw it against wall of tube, forming a thin film. The film then flows down by gravity, becoming concentrated as it passes through the heated zone. Evaporation thus takes place rapidly and uniformly in a continuous curvilinear flow of liquid from top to lower end of heated section.

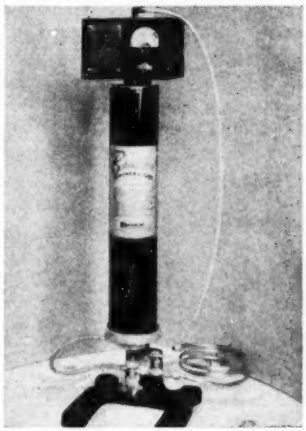
Action of blades not only maintains thin film, but also helps keep it in a continual turbulent motion, which prevents localized over-heating. Only a small amount of material to be evaporated is contained in tube. Time-at-temperature with unit is usually less than a minute, including that period required to cool the concentrated material.

Evaporation is ordinarily carried out under vacuum (reduced absolute pressure), the concentration temperature being a direct function of this pressure. Since the temperature can be preselected and adjusted, it follows that any advance effect of exposing a heat-sensitive material to elevated temperature will be minimized. Maker points to short contact time, as a means of retaining valuable aromatic and other important substances.

Concentrated material immediately leaves evaporator through outlet at bottom and is usually passed through a cooler, unless it is to be spray dried or subjected to a similar operation.—*Rodney Hunt Machine Co., Orange, Mass.*

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then turn to the Reader Service Section inside the back cover, where all are listed by pages and by subjects under, "Editorial: New Equipment, Supplies"—each one with a page key number after it. The key numbers also appear on the handy Reader Service postcard. So you circle those for the items that interest you, sign at the bottom, and mail. No postage is needed.



Keeps Constant Check On Water Purity

This Bantam Demineralizer comes equipped with a direct-reading water-purity meter. This feature enables anyone to tell the purity at any time, thus maintaining a constant check on the flow of demineralized water. For convenience, the instrument is calibrated in parts per million, and also scaled for electrical resistance (ohms).

As illustrated, the demineralizer also has a needle-type regulating valve for easy flow adjustment and a drain valve.

There is a sturdy base for bench mounting. Base may be removed if wall mounting is desired.

Users report units are ideal for industrial operations requiring relatively small amounts of demineralized water. —*Barnstead Still & Sterilizer Co., 2 Lanesville Terrace, Forest Hills, Boston 31.*

Magnesium Dock Board For Use With Trucks

Lightweight magnesium dock boards are reported to eliminate need for special designs in many loading applications. Each board has a fully adjustable automatic drop lick that drops down against the dock and locks the board securely to prevent slippage.

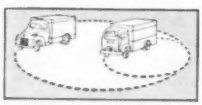
Trucks may back up to within 3 in. of the dock. Where truck bed is lower than dock level, boards can be reversed. They are crowned to compensate for height differences.

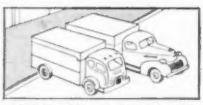
These all-magnesium dock boards are to be offered in two rated load capacities: 1,000 lb. per axle and 2,000 lb. per axle.—*Magline Inc., Pinconning, Mich.*

"NEW WHITE 3000 IS IDEAL FOR OUR CITY DELIVERIES"

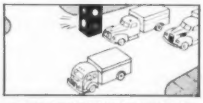
...says O. W. Hubbard, Traffic Mgr.,
ESS-KAY QUALITY MEAT PRODUCTS
Baltimore, Md.

CHECK THESE EXCLUSIVE ADVANTAGES

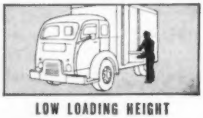

GREATER MANEUVERABILITY


MORE PAYLOAD—SHORTER LENGTH

NEW CAB SAVES DRIVER TIME


MORE EFFICIENT IN TRAFFIC

BETTER VISIBILITY...SAFETY


LOW LOADING HEIGHT

MORE DELIVERIES PER DAY with the White 3000! That is the report O. W. Hubbard, traffic manager, The Wm. Schluderberg-T. J. Kurdle Company, Baltimore, Md., makes.

"We find the White 3000 is ideal for city deliveries," he says. "It has much greater maneuverability and shorter turning radius... it saves time in traffic and reduces parking and delivery time."

It's the same story from coast to coast. Time savings can be measured all along the route... every day... in every phase of delivery service.

Here is the truck that is more useful... more efficient... more economical because it is engineered right to your exact delivery needs.

Ask your White Representative for facts about the White 3000 for your business

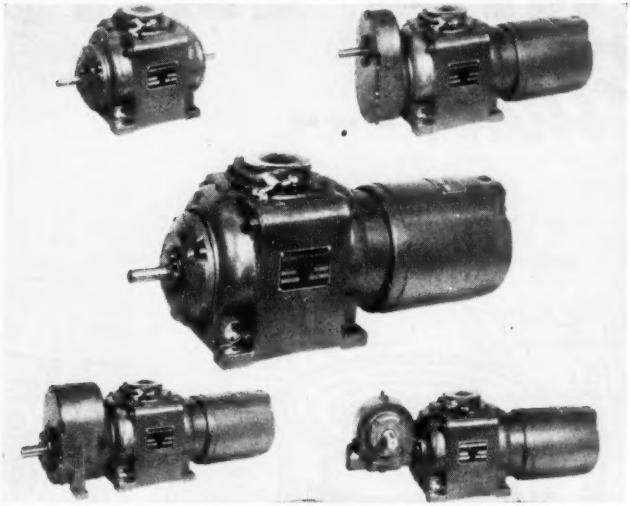
Tips its cab to service

THE WHITE MOTOR COMPANY

Cleveland 1, Ohio

For more than 50 years the greatest name in trucks

Vari-Speed Transmissions Use Lower Input Speeds



These new drives are designed for lower input speeds than formerly used. In previous transmissions, of sizes from ½ to 1½ hp., standard drive was 3,600 rpm. And where lower input speeds were used, the drives were spring loaded. New series operates at input speeds of 1,800 and 1,200 rpm. without spring loading.

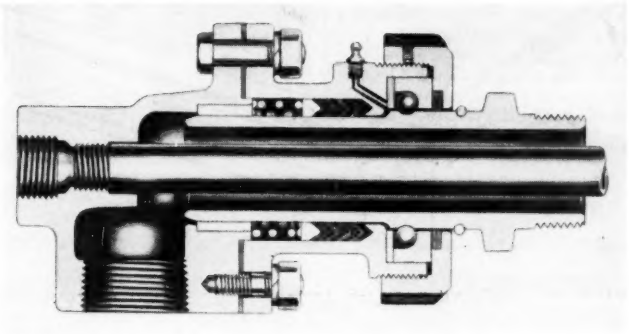
Lower input speeds are reported to give cooler, quieter operation with increased effieiency, also greater durability under the severe continuous-duty applications. Absence of spring loading makes it possible to change speed transmission while running or stationary. Inbuilt speed regulation provides accuracy of speed holding, even under conditions of wide load variation. Inherent overload protection proteets transmission and the driven machine from damage due to overload or jam in driven equipment.

All units in series are available with motor or with input shaft extension for coupling to a separate motor or belt drive. All sizes may be had either with standard output construction delivering speeds from .37 input speed to 0 or with a wide variety of types and ratios of built-in gear boxes, including single stage spur reducer, double reduction helical spur reducers, spur gear step-ups, and worm gear reducers.

Series is designed to use standard NEMA C flange motors of all types—open, totally enclosed, and explosion-proof. Dimensions are almost identical to previous "45" series designed for 3,600 rpm. operation. Shaft heights and dia. are same, width is same, and length is up less than 3 in.

Micrometer control is furnished as standard. Lever or single turn friction lock type controls are available without increase in cost. Also available are a wide variety of standard remote controls—mechanical, electrical, hydraulic and pneumatic. New model is mounted with only four bolts.—*Graham Transmissions Inc.*, 3754 *N. Holton St., Milwaukee* 12.

Low Torque Marks Compact Revolving Joint



Newly introduced is a compact, improved type revolving joint for use in making piping connections to drum type dryers, rolls, and other rotating equipment.

Designated as Type 1BR, the joint is characterized by very low torque, thus offering power savings. Models are available for handling steam, oil, air, water, gas, and chemicals.

Rotating portion of joint consists of a special precision machined and heat-treated steel tube that screws into hub of drum or roll. Non-rotating portion is ball-bearing mounted on this tube, specially designed ball bearings carrying load of both radial and end thrust.

Use of a sleeve-type pilot bearing at end of rotating tube insures alignment of joint and provides a long bearing against twisting or cocking. Self-adjusting, self-sealing chevron-type packing carried under light spring pressure provides a long life seal on rotating tube. Low maintenance cost is reported, since joints can usually be serviced without removal from roll. New packing can be installed in a few minutes, saving "down time" as well as repair costs.

Joints are built for 150 psi. steam, or 200 psi. hydraulic, and also for vacuum service. They are recommended for speeds up to 500 rpm. steam, or 750 rpm. hydraulic, and for temperatures up to 450 deg F., depending on packing specified. Standard sizes range from ½-in. up to and including 2-in.

Body types include both single and syphon or two-way flow models with straight and angle connections. In two-way flow models, a syphon pipe is extended through inlet tube for removal of condensate or discharge of gases or liquids.—*Barco Manufacturing Co.*, 1801 *Winnemac Ave., Chicago* 40.

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Going Places---

A good foursome makes golf more interesting . . . just as *National's* Sanitary Cans with their four "bonuses" make your production simpler.

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Bonus #3—Clear Crisp Lithographic Reproduction
Bonus #4—National's "know how" and service.

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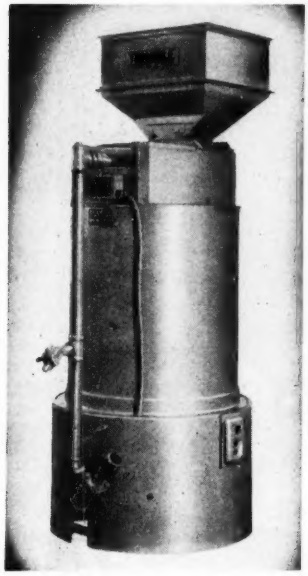
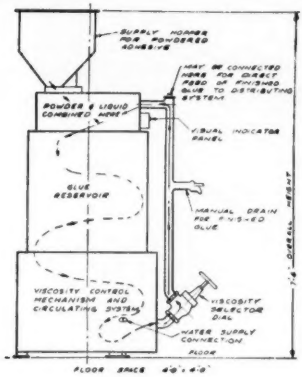
Dry Adhesive Converter Simplifies Gluing, Cuts Costs




SUPPLY HOPPER FOR POWDERED ADHESIVE
MAY BE CONNECTED HERE FOR DIRECT FEED OF FINISHED GLUE TO DISTRIBUTING SYSTEM
POWDER & LIQUID COMBINED HERE
LIQUID INDICATOR PANEL
GLUE RESERVOIR
MANUAL DRAIN FOR FINISHED GLUE
VISCOSITY CONTROL MECHANISM AND CIRCULATING SYSTEM
VISCOSITY SELECTOR DIAL
WATER SUPPLY CONNECTION
FLOOR
FLOOR SPACE 4'0" x 4'0"

Use of Visco-Mat—a machine that automatically converts dry adhesives into a ready-to-use liquid glue of the correct viscosity—is claimed to bring wide savings in cost, time and labor of gluing in various food-plant sealing and wrapping operations.

This system of adhesive preparation is stated to have the following advantages: Conservation of floor space because dry adhesive bags take up less room than drums, saving of freight charges on water constituents, glue consistency always right, no trial-and-error manual adding of water, cleaner and more efficient adhesive, no messy cleaning up, and no wasted batches due to crusting, drying or lumpy type mixtures.

Here is a comparison showing storage-space savings: Liquid glue, 2,750 gal., in 55-gal. containers, requires 600 cu. ft. of storage volume. The amount of dry adhesive needed to produce the same volume of liquid glue requires only 240 cu. ft. when stored in 100 lb. bags.

Sketch shows how unit works. Operator puts dehydrated adhesive into the hopper. He then sets a simple control dial to the viscosity desired. The machine automatically measures and mixes the water needed to produce this desired viscosity. The unit may be connected for direct feed of finished glue to the distributing system, or the glue can be withdrawn through a manually operated drain, if preferred.

For applications where the adhesive manufacturer does not recommend the use of dehydrated products, the unit can be equipped for handling heavy or viscous adhesives. Machine automatically dilutes and converts these heavy adhesives into liquid glues of the correct viscosity.—*Triangle Package Machinery Co., 6633-55 W. Diversey Ave., Chicago 35.*

Hoist-Equipped Truck Speeds, Eases Loading

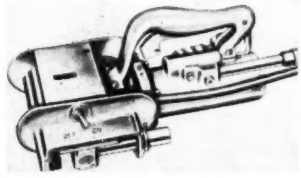
Lifting and stacking is reported quicker and easier with use of this new dual-purpose hand truck with built-in hydraulic hoist.

Combination truck and stacker is particularly suitable for loading and unloading cases and barrels from ground level where loading docks are not available.

A small, lightweight, maneuverable, hand mover, unit enables one man to handle heavy merchandise, transporting from one location to another.

Truck is compact, sturdily built and weighs only 111 lb. It has a capacity of 500 lb. and will lift loads of this weight to tail-gate height of 54-in. Platform is 22 in x 19 in. for accommodating large packages. Front of platform is flush with floor when lowered. Wheels are rubber, of 8-in. size. —*Clark-Hopkins Equipment Corp., Philadelphia 23.*

Portable Heat Sealer Has Time, Temp Controls



Desired sealing pressure is obtained by an integral air cylinder, and the adjustment of the dwell time is accomplished by a variable built-in pneumatic timer, in this Model 6 portable heat sealer.

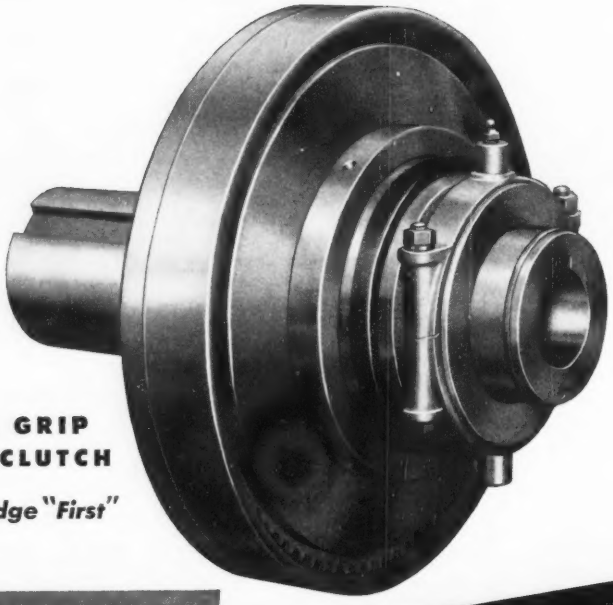
Temperature is automatically controlled from 250 to 500 deg. F. Unit requires a supply of compressed air and an electrical supply for the heater.

It was specifically designed for heat sealing all thermoplastic coated and laminated packaging materials. It is reported to seal foil and other barrier materials—over splices and wrinkles—and without delamination.

In operation, the operator positions the material to be sealed between the jaws, then pulls trigger and holds it until seal is completed and movable jaw retracts. Trigger is then released and operation repeated as desired.

Jaws are 6 in. long by ½ in. wide, and are self-aligning. Special contacting surfaces are available.

Use of this machine is stated to be non-fatiguing. Unit weighs 4½ lb. Package failures, due to faulty closures, are stated to be impossible when unit has been set for proper heat-sealing cycle.—*Packaging Industries, 50 Church St., Montclair, N. J.*



ROLLING GRIP FRICTION CLUTCH

—another Dodge "First"

It's Compact—
It's Flexible—
It's Smooth—
NO TOGGLES!

New and simplified design results in new ease of control, together with positive drive and extreme ruggedness. Dodge Rolling Grip Friction Clutches provide trouble-free, dependable service on many thousands of industry's tough installations.

There are no toggles! Instead, the mechanism shifts smoothly on hardened steel balls—and has the positive grip of a wedge. Operating parts are completely enclosed for safety, yet quickly accessible for service.

Dodge Rolling Grip Friction Clutches are available from distributors' stocks in two types—Bolted Plate and Gear Tooth Mechanism—in sizes from ⅓ H.P. to 21 H.P. at 100 R.P.M. For complete data, including easy Selection Tables, call your Dodge Distributor or write us. For capacities ranging from 21 H.P. to 470 H.P., ask for data on the famous Dodge Diamond D Friction Clutches.

Call the Transmissioneer, your local Dodge Distributor. He's factory-trained to help solve your power-drive problems. He has information on latest transmission developments. Look for his name under "Power Transmission Machinery" in your classified telephone directory.

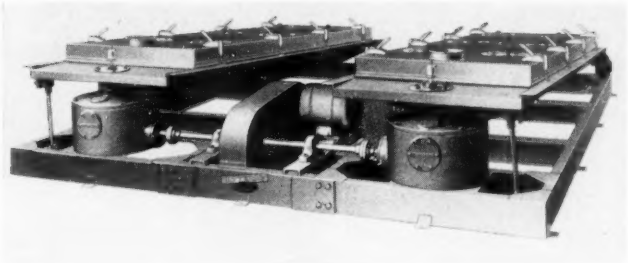
DODGE MANUFACTURING CORPORATION, 2800 Union Street, Mishawaka, Indiana

DODGE

of Mishawaka, Ind.

FIRST IN POWER TRANSMISSION MACHINERY

Tandem Mounted Screens Minimize Vibration

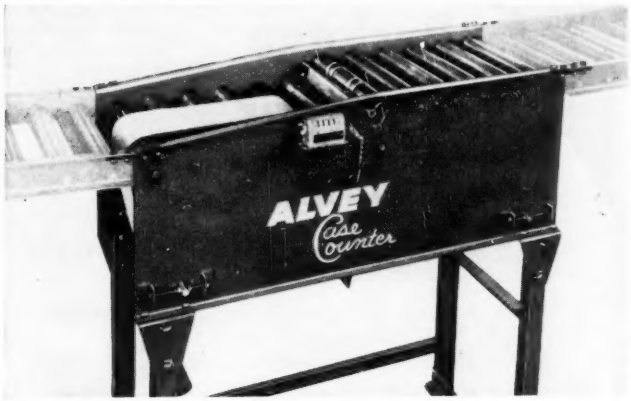


Vegetable meals, dairy products, and other food items are reported screened most effectively by these tandem mounted anti-vibration units.

Unique design features two screens compactly assembled on a common support frame and driven by a single motor. Vibration is stated to be virtually eliminated, thereby permitting screens to be installed in towers or in sections of buildings not rigidly supported. A single drive shaft powers the two eccentric drive heads so that they both rotate in the same direction.

The large production-size unit is shown. Both this and the smaller units double the output of the separations obtained by individual screens.—*The Patterson Foundry & Machine Co., East Liverpool, Ohio.*

Counts Packages Accurately, Despite Their Spacing



Regardless of how tightly packages may move along the conveyor line, this new counter records every one accurately.

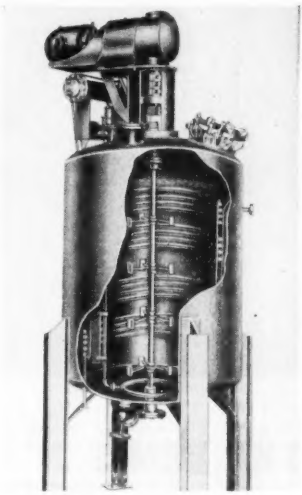
Unit fits between sections of gravity, belt, or live roller conveyors (in set-up in photo, movement is from left to right).

In operation, a short, powered belt carries the packages toward a barrier, where contact causes an air-cylinder to raise the front of each one. Then the belt propels each package over the barrier and deposits it on the live roller discharge unit, at which point the numbering machine registers the count. The mechanism then resets itself for the next package.

The positive stop eliminates any accidental release that would affect accuracy of count. Capacity of the counter is approximately 40 packages per minute.

Case counter is a self-contained unit, comprising motor-driven belt-type inlet, stationary package stop, automatic air-operated package release, live roller discharge, related limit switches, and either an electrical or a mechanical counter.

Standard units are designed for use with conveyors that measure 16¼-in. between rails. Other widths can be supplied as desired.—*Alvey Conveyor Manufacturing Co.,* 9301 *Olive Street Rd., St. Louis.*



New Hydrogenator For Fast Job

Developed for quick and thorough dispersion of gases and solids, this new hydrogenator features a radial propeller agitator. The unit is individually built for each application to operate under specific conditions of pressure, vacuum, temperature and degree of agitation.

Included in design are a right angle motor reducer, double mechanical seals (all parts accessible without removing drive), manhole with hinged cover, semi-flexible drive coupling, and removable bottom guide bearings. Coils are arranged to offer minimum obstruction to proper agitation. And flush design of the outlet valve eliminates a pocket in which the catalyst might accumulate.

Agitator was devised to provide rapid overturning and turbulent motion in the liquor, thereby thoroughly dispersing and entraining both the hydrogen and catalyst. According to maker, this results in the optimum condition necessary to maximum absorption and reaction. Propeller blade arms are removable. And they may readily be adjusted for a different degree and type of agitation when necessary due to a change of process or operating conditions.

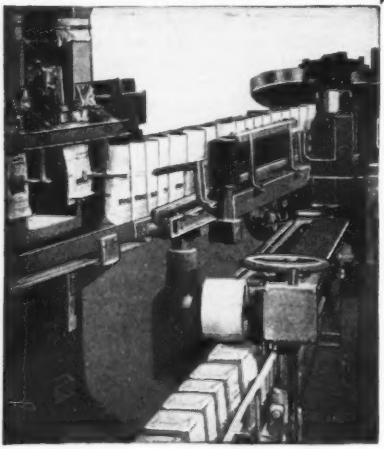
Independently supported at two points within the vessel, the agitator shaft of the unit mounts multiple radial propellers.

New hydrogenator can be supplied in stainless, nickel, Monel, Inconel or mild steel.—*Struthers Wells Corp, Warren, Pa.*

THE BEMIS DELTASEAL BAG *PLUS* DELTASEAL PACKAGING EQUIPMENT

Equals

The most Economical, Efficient Package for Your Product



- Deltaseal® filling and closing is fast... mostly automatic... less handling.
- Deltaseal Bags have a neat, square, full-pack appearance... build easily into eye-catching displays.
- Crisp, brilliant Bemis printing on Deltaseals headlines your brand.
- Consumers like Deltaseal's exclusive Pull-Cut-Pour Spout.
- Bemis Packaging Specialists help you get the smoothest, most economical service from your Deltaseal System.

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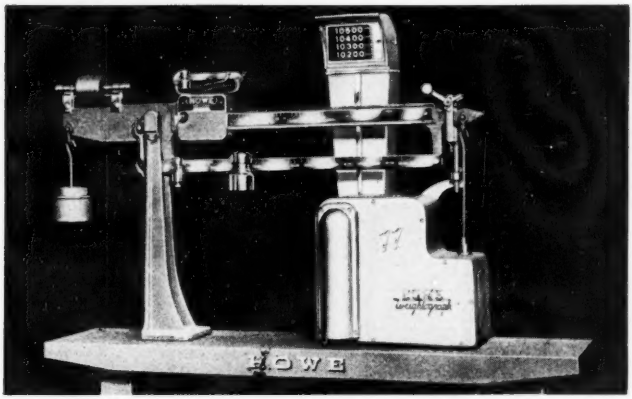
Bemis

BEMIS BRO BAG COMPANY

Device Converts Old-Fashioned Scale to "Automatic"



You can now make your old-style beam scale an "automatic" by simple attachment of a recently developed weighing accessory.

New unit can be used with any make of beam scale, or any scale convertible to beam operation. Known as the 77 Weightograph, it is readily attached to the beam shelf and connected to the beam with a rod.

Unit features a non-protruding periscope with a unique, convenient eye-level screen which instantly flashes the exact weight in large, illuminated figures for speedy reading. Optical projection increases image brightness and contrast five times. Image is read off mirror instead of a ground glass screen, contributing greatly to readability under all sorts of light. Reading line length is 15 ft.

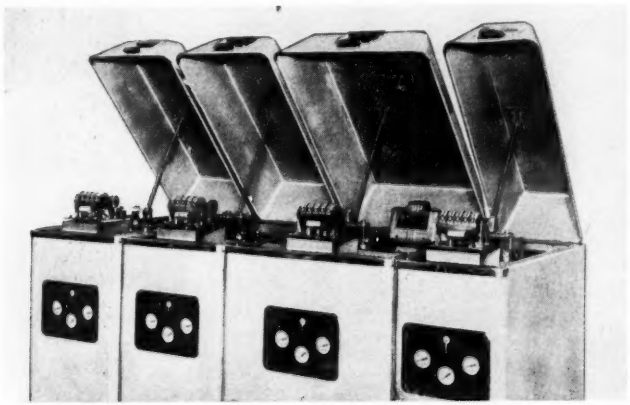
Positive drive in the simple mechanism means no lost motion or back-lash. Upward pull of connecting rod swings Weightograph chart in an arc, between a stationary light and magnifying lens. Figures and graduations on chart are magnified to about 40 times their original size and reflected by mirrors to screen of periscope.

Oil dashpot connected to chart unit dampens up and down movements of beam. This results in screen image coming to a stop quickly. Chart and pendulum shaft operate on ball bearings, as does lever. Unit is very sensitive, and maker states there are no zero change or inaccuracies with wide changes in temperature.

Light source is a long-life prefocused projection lamp with a bayonet lock for accurate positioning of filament. This means there is no need for adjustment of position of lamp, and no lamp can be substituted for correct one. Projection lamp greatly increases image brightness. A large condensing lens with a heat filter intensifies light on chart.

Unit is furnished with a shelf lever to allow greater flexibility in application. Weights can be added to counterpoise in order to increase weighing capacity. Modern appearance with attractive baked enameloid light blue-gray finish is a feature.—*The Howe Scale Co., Rutland, Vt.*

System Automatically Blends Two or More Liquids



Recent development is this automatic proportioning system designed for blending two or more of a wide variety of liquids.

No charts or calculations are needed, says maker, when setting the blender for any combination of ingredient proportions in increments to meet the customer's requirements. Total throughput is recorded on a master counter, and each ingredient is recorded separately on its own meter.

Master counter is available with predetermining device and/or ticket printer, and the meter for each ingredient is available with standard counter or with ticket-printing unit.

Failure of any ingredient supply automatically shuts off entire system. If supply to any meter ever slows down, all meters synchronize automatically to same rate of delivery.

All measurement is by accurate, positive volumetric displacement, and any number of ingredients may be blended. If number of ingredients is reduced at any time, one or more meters may be made inoperative.

Dials and gages are visible from outside of dust-resistant cabinet enclosing the blender. Unit can also be equipped for use in corrosive areas.

Blending systems for almost any combination or quantity of liquids are achieved on a production basis by making cabinet in sections which accommodate various types of stock meters.

Advantage claimed for system is elimination of need for large storage facilities, for, and inventories of, blended stocks and double pumping. Liquids can be blended as required to go directly to storage, tank cars, or containers.—*Bowser, Inc., Fort Wayne 2, Ind.*

"Need a big talking point? try **Vitamin A!"**

IT'S often surprising what one good new "talking point" can do to a sales curve. If *yours* could stand improvement, it will pay you to look into the possibilities of enriching your product with DPi Vitamin A.

Like many others, you may find that this taste-free, odor-free natural concentrate has the right appeal on your label to put new life into an old product.

Or you may find that Myvax 16 Synthetic Vitamin A Palmitate with its unique stability permits foods to be A-enriched that couldn't be till now.

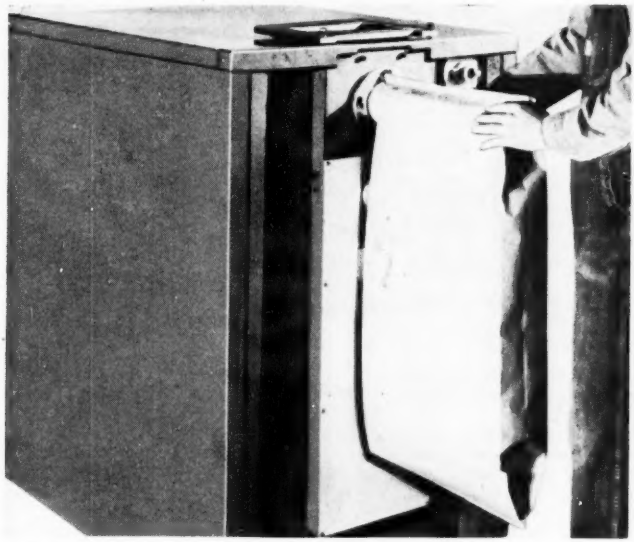
Let's talk about *your* product and vitamin A. It could be a mighty profitable conversation—for *you!* To arrange a date with the world's foremost specialists in vitamin A, simply write to ***Distillation Products Industries,*** 723 Ridge Road West, Rochester 3, N Y (Division of Eastman Kodak Company). Sales offices: 570 Lexington Avenue, New York 22, N. Y. • 919 N. Michigan Ave., Chicago 11, Ill. • Gillies & Loughlin, Los Angeles and San Francisco • Charles Albert Smith, Ltd., Montreal and Toronto.

"Myvax" is a trade-mark.

leaders in research and production of both natural and synthetic vitamin A

Also . . . high vacuum equipment . . . distilled monoglycerides . . . more than 3400 Eastman Organic Chemicals for science and industry

Valve Bag Packer Is Fully Automatic



Labor saving advantages are offered with use of a new bag packer which fills valve bags (25 lb. to 100 lb. capacity) with any free-flowing substance from powder to pellets.

Known as the Auger-Matic it has pushbutton controls and is fully automatic, including weighing device with secondary adjustment wheel for fine weight adjustment. In operation, attendant, slips bag on spout, then presses pushbutton to start unit. When contents of bag reaches preset weight, machine shuts off automatically. Then, operator removes bag, tucks in valve, and it is then ready for shipment.

Unique feature is the multiple auger, which can be changed to fit the type of product being packed. It takes only a few minutes to change the auger or to remove it for a thorough cleaning operation.

Packer can be supplied with single- or two-speed motor to meet varied requirements of users. Height is 45-in. overall, which permits placement under tanks, hoppers or other feed lines. Other dimensions are 42-in. long by 28½-in. wide.

Long-nose spout eliminates all dust and dirt when filling valve bags. Unit can also be used for filling barrels and open-mouth bags through use of an adapter.—*E. D. Coddington Manufacturing Co., 505 N. 37th Street, Milwaukee 9.*

Less Aisle Space Needed for New Truck

Operation in narrower aisles is permissable with a new model battery-powered, driver-led industrial truck. For it is 10 in. shorter than previous models. This abbreviated length—63¾ in.—is one of developments.

Better protection for all operating parts is provided by the new cast drive housing and a cast collector ring cover, bolted securely to the frame. A solid steel enclosure, with hinged doors and a drop pin lock for quick battery changes, gives battery protection.

Truck includes the new field-tested motor designed for use throughout the '101' series. Highlights include gear drive unit with first reduction chain, fully enclosed, replacing double reduction chain drive; full magnetic contractor control, to reduce electrical and mechanical wear; braking through entire gear reduction by placing brake on motor shaft, aimed to add to effectiveness and extend brake lining life; and an estimated 20 percent increase in efficiency over earlier motors.

Compactness of lifting mechanism permits placing it on power head instead of on uprights, providing better vision for operator.

Truck is made in 4,000 and 5,000-lb. capacities. Lift is 70 in. and mast height is 83 in.

Improved weight distribution, more rigid construction, and a lower center of gravity make for load stability. Weight of uprights is moved forward nearer to a point over the drive wheels, meaning better traction.

Revision of handle allows controls to be worked when it is in upright position. This is a space saving feature and permits use of the unit in cramped quarters.—*Automatic Transportation Co., 149 W. 87 St., Chicago.*

Carpenter's New Slide Chart Gives Data on Stainless Tubing

Bending information for Stainless Tubing and Pipe shows desirable radii for bends of 45° to 180°.

Coil diameters for Stainless Steel Pipe from 1/8" to 4" are given in easy-to-use form.

The Carpenter Stainless Tubing Slide Chart gives you data on Analyses, Standard Sizes, Bends with and without Mandrels, Tensile Strength, Rockwell Hardness, Heat Resistance, etc.

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Carpenter STAINLESS TUBING and PIPE
THE CARPENTER STEEL COMPANY
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Alloy Tube Division, Union, N. J.
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STAINLESS TUBING
Analysis — Tolerance — Finish
— guaranteed on every shipment

Detects Minute Leaks in Vacuum Systems

For use in vacuum systems down to one micron Hg, a new sensitive leak detector has been announced.

Known as the Model LD-01, it operates on the principle that the tendency of hot platinum to emit positive ions is enormously stimulated by infinitesimal traces of halogens or their compounds.

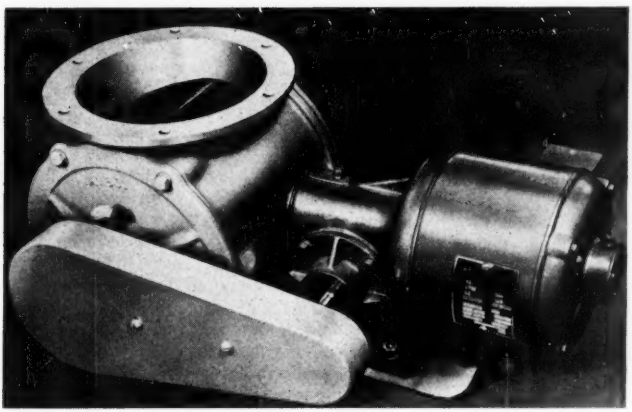
In operation, the glass sensitive tube of the detector is sealed into the system under test, and the system is then pumped down to a moderate vacuum. A jet of harmless Freon gas (or other halogen-containing gas) is then directed against portions of the system suspected of leaking.

When the jet strikes a leak there is a sudden deflection of the meter needle because the gas—entering the system—instantly increases the ability of a hot platinum anode (set in the sensitive tube) to emit positive ions.

The circuit is a simple one, employing only three standard radio tubes. The unit is housed in a cabinet 10-in. wide, 7½-in high, and 8-in. deep. And for convenience in working around large systems, there is a dolly for carrying it.

The sensitive tube is 5-in. long, 1 5/16-in. in dia., and has a 3-in. tubulation, 7/16 in o.d. This may be connected to a system under test with a fitting of the stuffing-box type.—*Distillation Products Industries, Rochester, N. Y.*

Provides Accurate Air-Conveyor Feeding



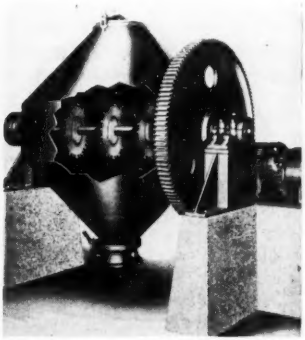
Recently announced is a new rotary airlock feeder for pneumatic materials handling systems.

This device provides a positive, accurate method of feeding powdered and granular products into air conveying lines and for supplying material at a predetermined rate into mixers, blenders and hoppers. It also serves to seal off air leakage at the discharge end of dust collectors and other pneumatic equipment.

Model PAV feeder has a cast iron body, end plates and rotor, all machined for accurate assembly. Rotor has machined slots for renewable rubber wiper strips to insure a tight, yet flexible seal against air leakage. Rotor assembly is carried on ball bearings mounted on the end plates. Bearings are sealed against leakage on the outside, with an additional seal on the material side to prevent oil leakage into the feeder and to keep dust out.

Model PAV-8 feeder is equipped with a ⅓-hp. dual-voltage enclosed-type motor reducer. And the PAV-10 feeder is equipped with a ½-hp. dual-voltage enclosed gear motor.

Manufacturer recommends feeder in handling of whey powder, sugar and cocoa and other similar products.—*Prater Pulverizer Co., 1515 S. 55th Court, Chicago 50.*



Moist Foods Won't Faze Disintegrating Blender

Here is newly designed disintegrating conical blender stated to successfully mix food products that contain small amounts of moisture, even though such materials, particularly when of small particle size, may form agglomerates during the mixing cycle.

Unit is equipped with disintegrating elements mounted on a shaft extending through the blender trunion. These elements, rotating at high speed and counter to the blender proper, break up agglomerates that are formed.

Available are sizes having operating capacities of .35 to 550 cu. ft., in mild steel or alloys, as required.—*The Patterson Foundry & Machine Co., East Liverpool, Ohio.*

In Behalf of Progress . . .

An Institute of Food Engineering Is Needed

Research is to industry what life insurance and a pension plan are to the individual. Research provides year-to-year protection and secures the future.

Pooled research also is comparable to insurance in that it spreads the cost among many.

Progressive food processors and equipment manufacturers have amply demonstrated the value of research to the vitality of their businesses. And agencies such as Nutrition Foundation have made pooled research pay off handsomely by spreading the expense.

It therefore should be highly beneficial to the food processing industry, as well as to equipment manufacturers, to support an organization with facilities for solving food engineering problems.

Such an organization has been suggested by Milton E. Parker, director of the food engineering program at Illinois Institute of Technology. And we believe that his suggestion merits much more than casual consideration by people in the food processing and allied industries.

The pattern for this institute might be similar to that of the Institute of Gas Technology, which is affiliated with IIT. This is a nonprofit research and educational organization founded in 1941 by gas industry executives. It conducts fundamental and applied research for the gas industry, stimulates and correlates research within the industry, and trains promising young technical men at the graduate level specifically for that industry.

If an industry whose annual revenue was well under two billion dollars in 1949 can support such a research and educational effort, then the thirty-three billion dollar food processing industry ought to be able to do something comparable.

The food industry might finance an Institute of Food Engineering through membership fees from processing and equipment companies, plus fellowships established by firms with specific projects.

Membership could entitle a firm to the results of the overall research program, while a fellowship fund might provide exclusive rights to the results of an individual project.

Because of a great need for more research on food engineering, we urge you to give the Institute idea serious thought. Then express your thinking in a letter to FOOD ENGINEERING or to Milton E. Parker.

Fish Industry Should Heed Technologists

There probably is no branch of the food industry in which more extensive application of technologic know-how would yield greater results—in terms of increased per capita consumption of product—than in the fish industry.

This is true for two fundamental reasons: (1) In terms of top-quality retention, fish is an extremely perishable food. Like corn on the cob, fish loses that extra something in taste value very soon after it is "harvested." (2) The technical know-how for putting high-quality fish into the consumer's kitchen is largely available and needs only to be effectively utilized to a greater extent.

Dr. William F. Hampton, who supervises basic and quality control research for Birds Eye and 40-Fathom fish products, recently put it this way:

"The fishing industry simply can't hope to progress without technology. It can't hope to meet the standards which the people of the United States want in the way of foods." Dr. Hampton also pointed out that technology is not being used to its full extent in the industry. And he makes two suggestions which get at the roots of the problem. One is that technologists learn to dramatize and sell their services. The other is that management strive for a greater appreciation and understanding of what technology is and does.

The idea of dramatizing the value of technology should be seriously considered by organized groups in the fishing industry, not by technologists alone. The industry might greatly speed improvement in fish quality through rigorous application of the best known practices in a demonstration project in which top quality fish are made available in a test market area. The project and procedures followed could be widely publicized, and the figures on the increased sale of fish would be something everyone could appreciate, even the fish-market operator.

Quick freezing, of course, has done a lot to improve fish quality. And quick freezing aboard fishing boats is particularly effective. In Denmark, fish have been kept alive in the ship's hold until the boat reached shore. Fish farming adjacent to a quick freezing plant is being done in Nevada.

Unusual and expensive methods might not be necessary if more technology were applied to existing fish catching, handling, processing, packing and distributing operations. But if technology is not so applied, the fish business will fail to realize anything like its maximum sales potential.

Most well-informed people in the fish industry believe that more fish would be sold if the quality were better. Technologists know that quality can be improved—and they know how. Why wait?

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LIGHTNIN PORTABLE MIXERS provide *double mixing action* in any tank or kettle—fast bottom-to-top turnover, plus slow rotation of contents that gives thorough agitation, without special baffling.

Lightnin Portable Mixers are available in sizes from ⅛ to 3 HP. Direct-drive models for high-speed agitation of fluids up to 500 centipoises. Gear-drive models like the one shown, for slower-speed agitation of fluids up to 4,000 centipoises. Electric and air motor drive, in a wide range of materials. Write today for information and prices.

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FOR CLOSED TANKS . . . Lightnin top entering propeller mixers permit mixing under pressures up to 125 PSI, or full vacuum. Built-in stuffing box and flange easily adapted to existing tank nozzles. Direct drive, gear drive; sizes ¼ to 3 HP.

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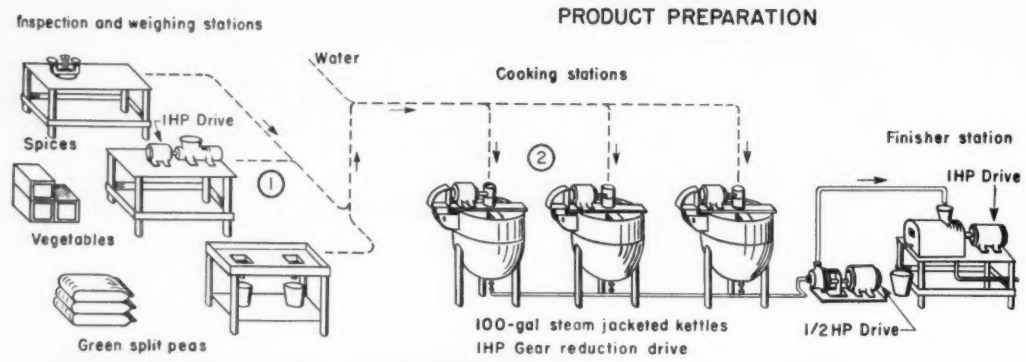
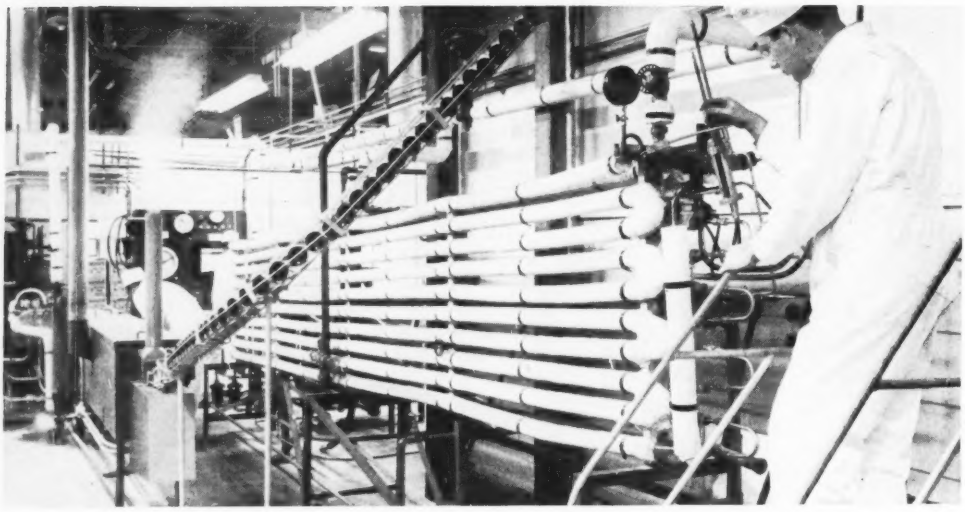




OVERALL VIEW of product and can sterilizing equipment. Short-time high-temperature heat exchanger is at right, with employee checking certified thermometer. Can sterilizer is at left, control panel in background.

Unfold Here ⟶

Prize Process—Aseptic Canning

Revolutionary Sterilizing and Packaging System as Applied to Pea Soup

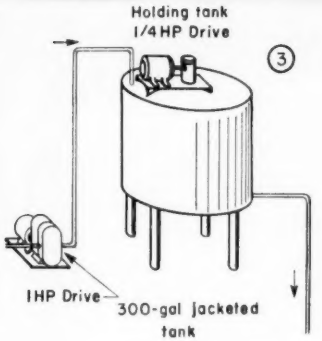
HERE IS THE PROCESS which won the 1951 Food Engineering Award for outstanding achievement in food technology—detailed in a flow diagram and pictures. It is the Martin continuous aseptic canning system as adopted for pea soup by Andersen's Foods, Inc., Santa Barbara, Calif. It represents a significant advance in canning technics and is applicable to many fluid foods.

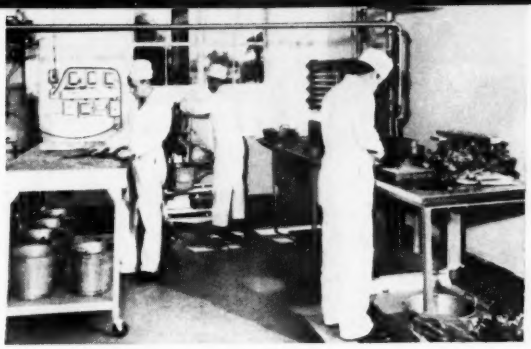
The complete pea soup operation, from preparation to can washing, is shown. In preparing the product, green split peas, chopped carrots and celery, and seasoning ingredients are inspected and weighed—Point 1 in diagram. Water is then added to the ingredients and the batches cooked in 100-gal. stainless steel agitator kettles at a rate of 300 gal. an hour. After cooking, the soup is pumped to a finisher for removal of extraneous material and thence to a jacketed holding tank.

From this tank, a positive-displacement pump delivers the soup to a 2,000-psi. triple-piston pump which forces it through a continuous small-bore pressure heat exchanger

More Information:

For discussion of award-winning aspects and fundamentals of process, see article, Award For Progress, page 67. And see also page 71 for description of fresh milk canning operation using short-high aseptic system.

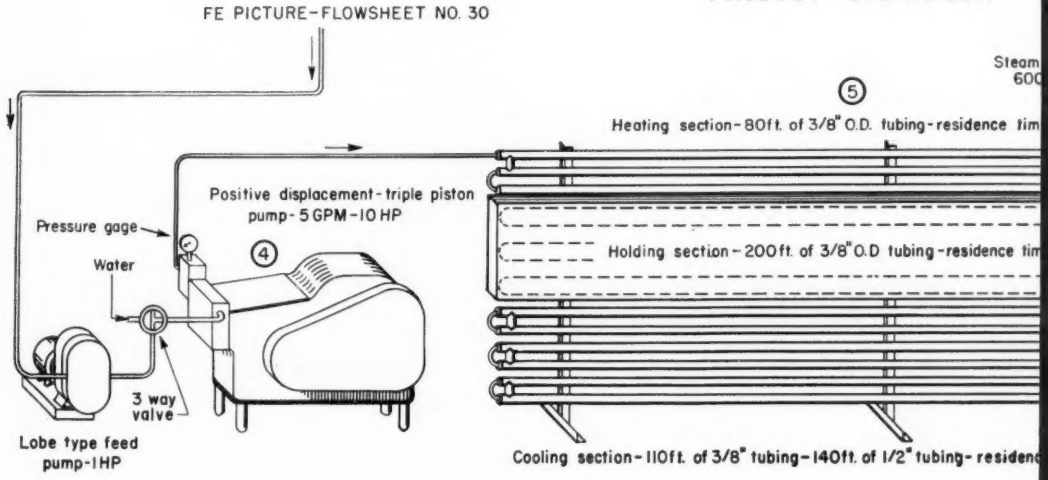




1 **INGREDIENTS** are prepared here. Carrots and celery are trimmed (right) split peas are inspected and measured (left), and vegetables chopped (center).

2 **COOK RO** kettles. O poured into

PRODUCT STERILIZER



—Point 5. Here the temperature is raised to 285-290 deg. F. in 3.5 sec. and held for 8.8 sec., then the cooling section of the exchanger reduces the temperature to 90 deg. in 17 sec. From the cooler, the soup flows to the filler.

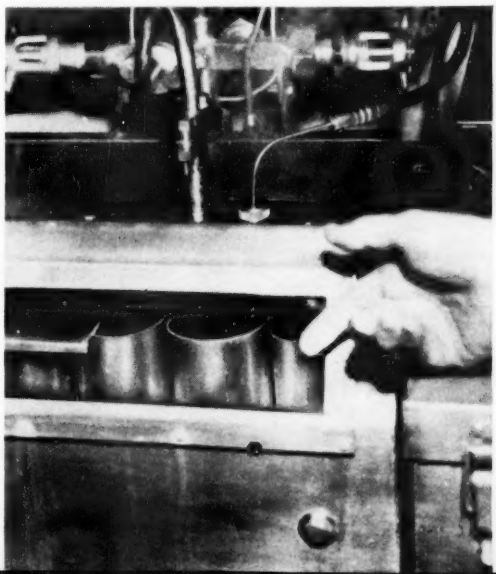
Meanwhile, empty cans are sterilized in superheated steam at 400 to 600 deg. and conveyed under a valveless nozzle that discharges soup continuously into the cans in an enclosure maintained at 330 deg. The filled cans are conveyed through steam to a closing machine that applies steam-sterilized lids in a 330-deg. enclosure. Now the cans go through a washer, marker and labeler, then move to a case packer to complete the operation.

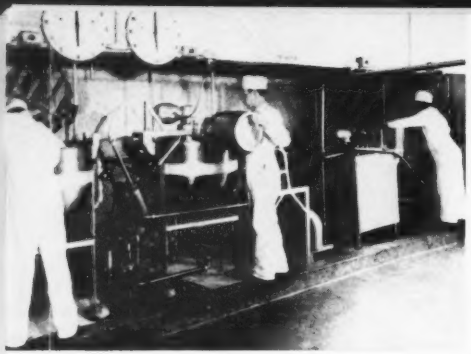
To assure effective sterilization, the process, from holding tank to finished product, is under automatic control, and temperatures are recorded. One temperature recorder documents the product temperature. Another, with an 8-point strip chart, records temperatures from eight points in the system and also provides a "run record" which ties in with can-filling operations. Both recorders are equipped with minimum-temperature alarms.

Each day before processing starts, the system is sterilized with hot water admitted through a 3-way valve ahead of the high-pressure pump.

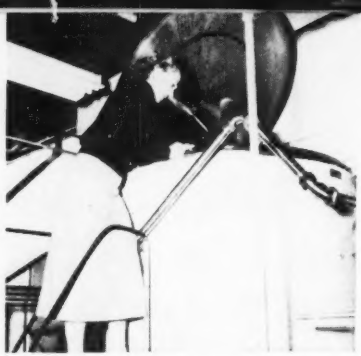
The process, which has wide latitude between sterilization and over-cooking, has been approved for operation in the State of California under inspection similar to that for conventional canning.

8 **VALVELESS FILLER** with nozzle that discharges soup into cans continuously as they pass through steam.

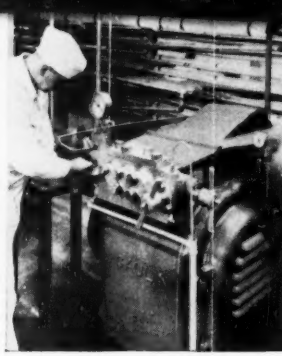




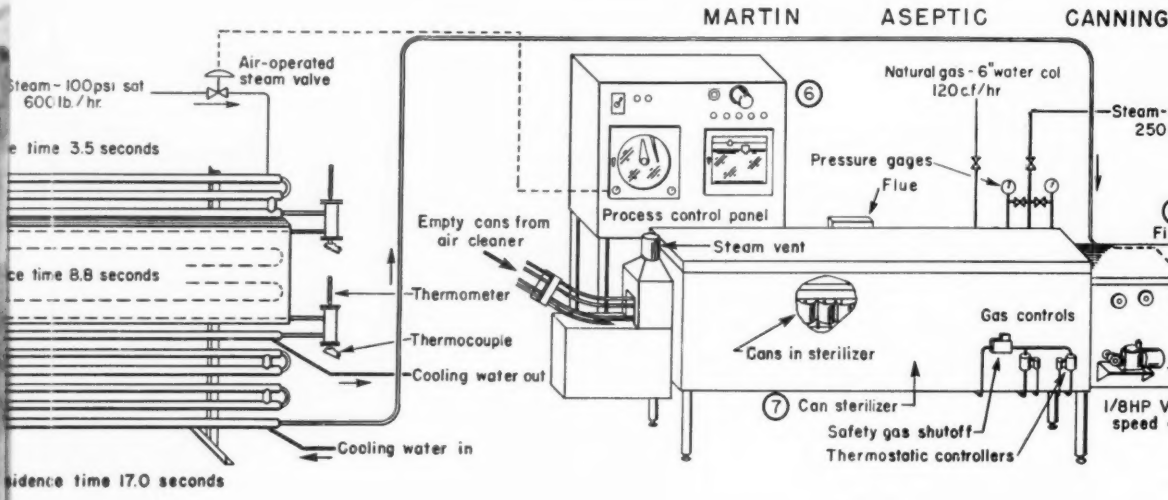
K ROOM has three 100-gal. steam-jacketed stainless steel
es. One at left is being cleaned while ingredients are
into next kettle.



3 HOLDING TANK, with cover raised for inspection. Soup is pumped from kettles to this tank.

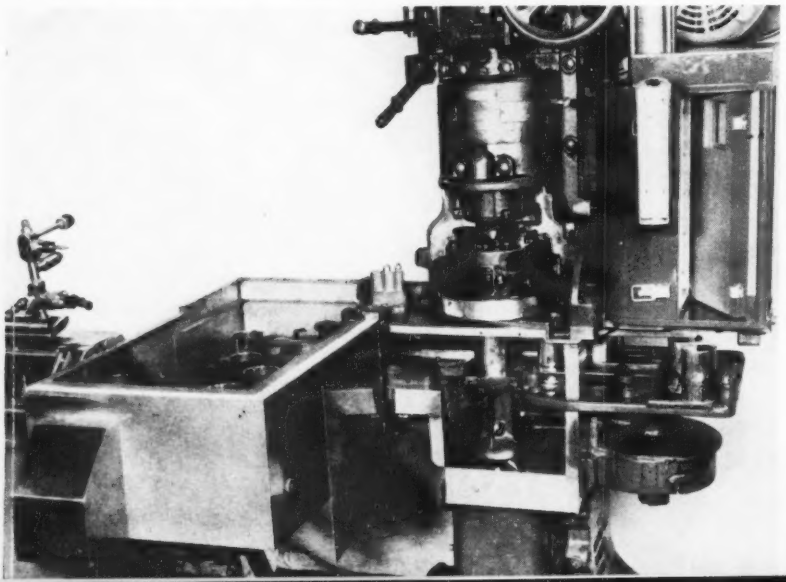


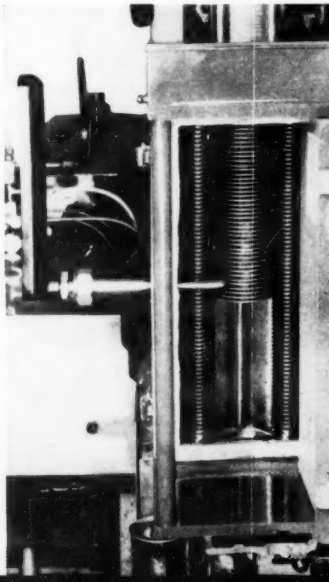
4 HIGH-PRESSURE pump which forces soup through small-bore heat exchanger tubes.



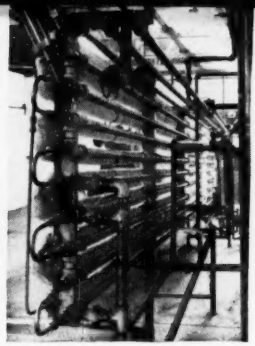
9 CAN CLOSER and feeder, with covers removed. Steam surrounds cans in both feeder and closer to maintain aseptic conditions.

10 CAN LID sterilizer, minus cover. S
rate lids for exposure to steam.

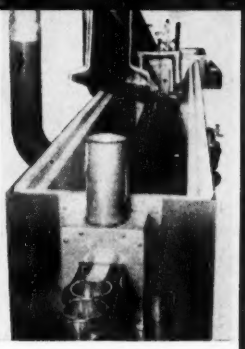




ump which
small-bore

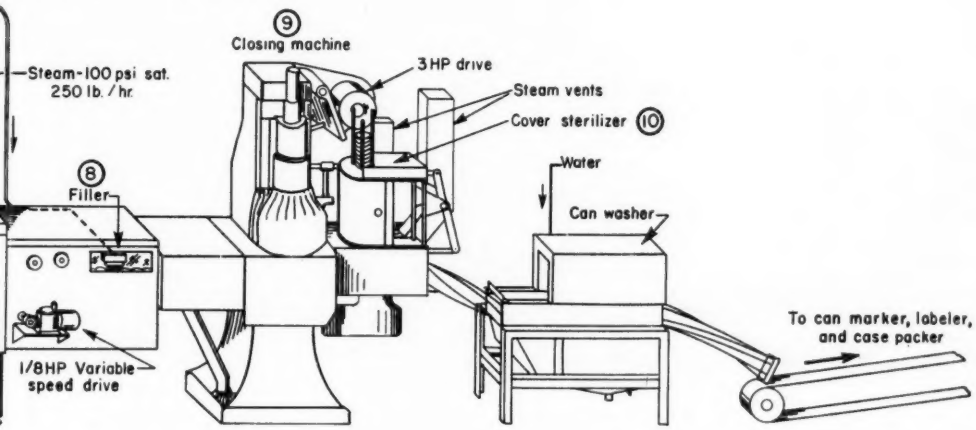


5 **HEAT EXCHANGER,** where soup is quickly sterilized at 285–290 deg. F. and cooled.

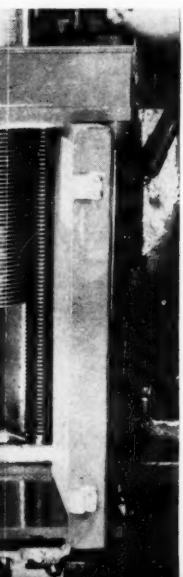


6, 7 **CONTROL PANEL** with instruments which closely regulate and record temperatures. Can sterilizer (right), open to show interior. Steam heats containers to 400 (plus) deg.

ANNING SYSTEM



us cover. Screws sepa-
o steam.



LIST OF EQUIPMENT

Product Preparation

Enterprise food chopper, 1-hp. motor drive.
Hamilton 100-gal. stainless steel kettles, two-thirds steam-jacketed, with 1-hp. agitator drive and hydraulic agitator lift.
Cherry-Burrell, ½-hp. Flex-flo pump.
Langsenkamp stainless steel finisher, laboratory size, 1-hp. motor drive.
Waukesha No. 25BB pump with 1-hp. motor drive.
Steriline 300-gal. stainless steel holding tank, with ¼-hp. agitator and hydraulically operated cover.

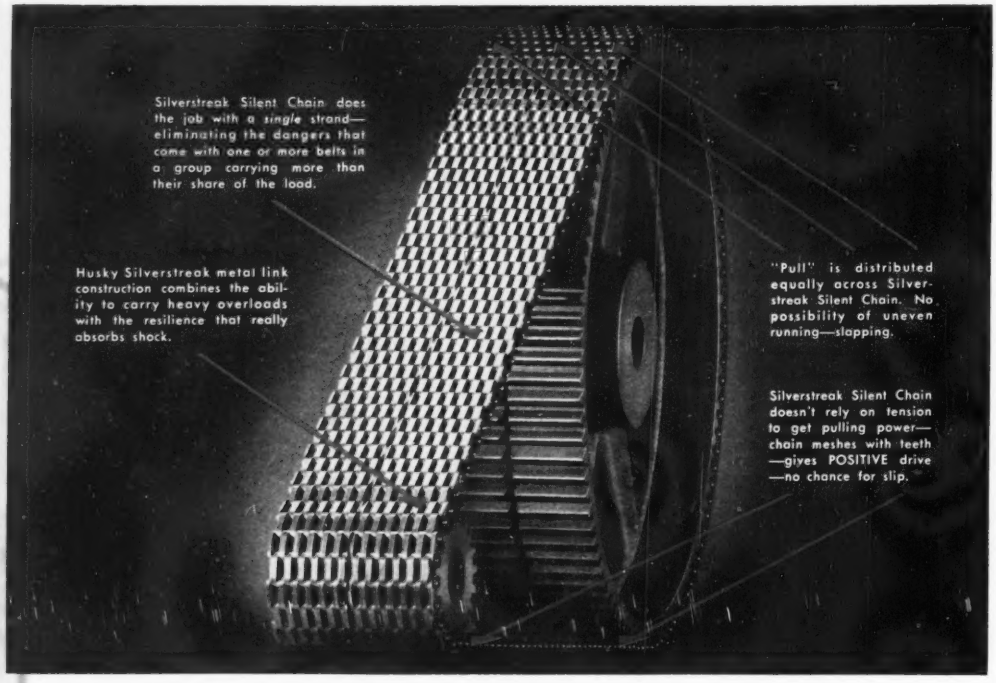
Product Sterilization

Waukesha No. 25BB pump with 1-hp. motor.
Manton-Gaulin triple-piston high-pressure pump, 300-gal. per hr., 10-hp. motor drive. Pressure capacity, up to 3,000 psi. (2,000 psi. maximum in this process).
Mallorizer heat exchanger. (Suitable alternates, depending on viscosity and other properties of product, might be used, such as Votator, Mojonnier tubular heat exchanger, or equivalent equipment.)
Belfield air-operated steam valve, ¾-in., reverse acting, with Brown valve positioner.

Martin System—James Dole Engineering Co.

Process control panel, including:
Brown Electronik strip-chart potentiometer-recorder, 8-record, 0-600 deg. F.
Brown Electronik circular-chart, air-operated control potentiometer, 150-350 deg. F.
Minneapolis-Honeywell Model L656A temperature controllers.
Brown thermocouples.
Can Sterilizer, including:
General Controls Thermopilot safety shut-off valve and pilot burner.
Partlow temperature controllers, 100-650 deg. F. range.
Ensign ribbon gas burners.
Filler, including Graham ⅓-hp. variable-speed drive, 0-55 rpm.
American Can Co., Model 00-6SF closing machine adapted to Martin process. (Alternate—Continental Can Co. Panama closing machine. For cans larger than No. 404 diameter, use American Can Co. Model 08 or Continental Can Co. Model PDS).
3-hp. totally enclosed motor (can closer).
Can washer (James Dole Engineering Co.).
Cover sterilizer (James Dole Engineering Co.).
Bruceway can marker.
Burt labeler.

Get full rpm transmission...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WHY
Controls are Necessary

One of the encouraging characteristics of the American people is their dislike for government controls. This augurs well for the future of their economic and political freedom.

But for the next few years we must not only tolerate but also help to make effective a whole battery of emergency government controls over our economic life. If we fail to do this now the future of that freedom we cherish will be imperilled. It is the purpose of this editorial—the third in a special series—to explain in simple terms why this is so.

After our military victory in World War II, we rushed through a demobilization which cut our military strength to about one-tenth of its wartime peak. Our allies did much the same thing. But the Russians maintained much of their wartime military strength and built up that of their satellites. With prodigious speed we switched from military to civilian production and went on to enjoy a rousing postwar boom—the greatest in our history.

This boom was in vigorous progress when, on June 25 last year, the Russian-sponsored North Korean army attacked South Korea. Our industrial production was rolling along at almost twice its prewar level. We had labor shortages in many key industrial areas. Under the impact of heavy buying all along the line, prices were climbing.

When the North Koreans smashed into South Korea they smashed into our national consciousness this fact: if we want a fair chance to save our national freedom from destruction by Communist aggression, we must race to restore some of the military power we had so speedily written off after World War II. And we must do it with our resources already very fully occupied with a boom in civilian business.

Program Small Compared to World War II

Compared with our military effort in World War II, the mobilization on which we are now embarked is small. At its peak, under present schedules, it will absorb no more than one-fifth of the total national production. During World War II we reached a point when nearly half of our total production went for war-making.

Moreover, our economy now is much bigger and stronger than it was in World War II. During the last decade there has been an increase of about 15 percent in our labor force. Our workers have had the training advantage of steady employment. The capacity of our industrial establishment is two-thirds again as great as it was ten years ago. Since the war no less than $70 billion has been spent to expand and modernize it.

Given time, the industrial giant we have created could pick up in its stride the added load of production for defense that now is con-

templated. But speed is of the very essence. There is little dissent from the proposition that if we are to stand off Russian aggression successfully we have, at the outside, two years in which to get ready.

Controls Needed to Prevent Chaos

These two facts – (1) the necessity for speed in our rearmament program and (2) an economy already stretched taut by a record civilian boom—create the general necessity for government controls. If we simply pile the billions of added defense expenditures authorized since last June on top of the civilian boom, and let it go at that, two destructive developments would follow. There would be a scramble for scarce materials, notably metals, which would create chaos in those markets. And prices would go through the roof.

Our situation during this mobilization is radically different from what it was when we rushed to get ready for World War II. Then we started with an economy that was coming out of a long depression. There was plenty of slack. Even in mid-1941 we still had over 6 million unemployed. Thus it was possible for us to expand war production greatly and also increase civilian living standards before the limits of our productive capacity made extensive controls necessary. But as we begin this new mobilization we find our economy already operating virtually at capacity. This fact is of key importance in understanding why this relatively small defense program so quickly requires the imposition of controls.

The selection and administration of controls thus far has been badly bungled. The threat of price controls, for example, was broadcast so vigorously and for so long that our people were virtually asked to raise prices and thereby do much to defeat the controls. Adequate taxation directed so as to attack inflation at the source and thus give direct price control a chance to operate has not yet been provided.

Indeed, we could readily assemble a long and devastating catalog of the deficiencies of the government's control program. But that would not dispose of the necessity for controls – by priority, by allocation, and, as a stop-gap, by direct prescription of selling prices – if we are to carry out our mobilization successfully. That is the only means by which a clear right of way for defense production can be cut through the highways of trade and commerce now jammed with civilian boom business.

Hope In The Wilson Plan

Since he became Director of Mobilization, Charles E. Wilson has added a new element of order and hopefulness to the mobilization program. He has laid out a plan which, if we are spared all-out war, would do three things by 1953. First, it would produce the weapons needed by our army and our allies to meet an immediate threat. Second, it would create the capacity that would enable us to move at high speed into weapons production for all-out war – if necessary. Third, it would create the additional production capacity that would restore by that date our ability to resume the climb of the American civilian standard of living.

In technical and industrial terms the Wilson Plan seems to be feasible. If it is successfully carried out, we should be able to begin getting rid of controls rapidly by 1953. But to carry out the program successfully, it must now have vigorous support from everyone. That does not mean mere agreement that it is a good plan. It means that we must conform to the controls that are necessary to make the plan work. In developing this support, the business community is in position to exercise crucially important leadership.

As has often happened in our national history, we are confronted by a paradox. We must accept emergency controls for the time being to insure survival of the freedom that they infringe. But, as we do this, we may find some comfort in the reflection that while controls from Washington are hateful, controls from Moscow would be infinitely worse.

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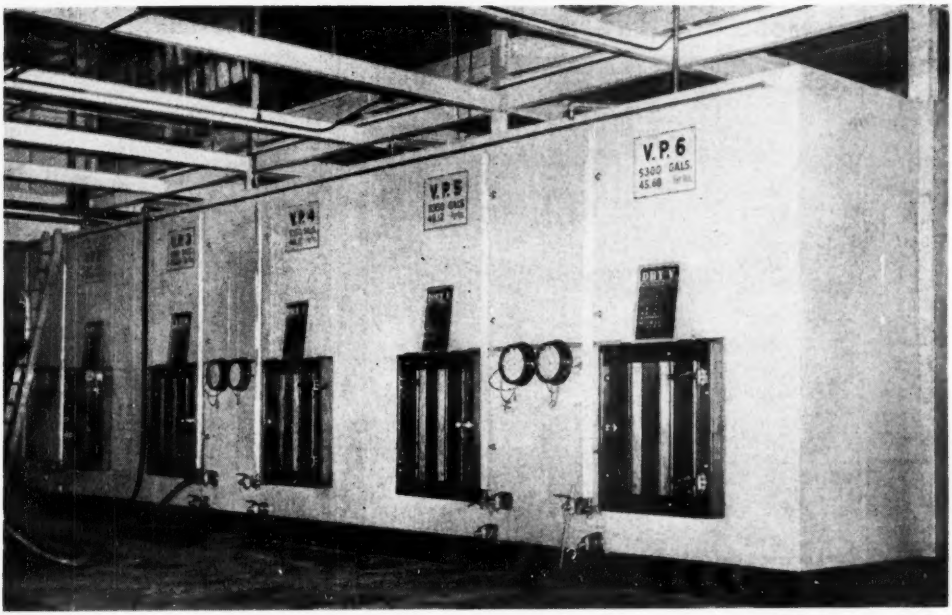


THESE plastic-lined, insulated concrete vats are being used in Heublein's winery to promote precipitation of cream of tartar and other solids from chilled wines. Instruments in front of vats keep constant record of temperature of wines.

Concrete Vats Give 7 Benefits

Winery's reward is absence of sediment in bottled goods, savings in floor space and product, easier cleaning, longer life of tanks, and less contamination

F. GALLIZIO

Consulting Chemist, G. F. Heublein & Bros., Inc., Hartford, Conn.

Replacement of some of the oval, wooden storage casks in our winery with plastic-coated, reinforced concrete vats has brought about seven significant benefits—

1. **An approximate 30 percent savings in floor space.**
2. **Elimination of evaporation and leakage of wine from vats.**
3. **Easier cleaning because vats are smooth-surfaced.**
4. **Minimum contamination of wine due to undesirable microorganisms. (Smooth, inside surfaces of the plastic-coated vats do not permit accumulation of spoilage organisms.)**
5. **Longer life for the storage vats and less maintenance.**
6. **Sediment-free bottled wines, because storage vats are insulated, promoting precipitation of cream of tartar from chilled wines.**
7. **Protection against fire and flood damage.**

All told, there are ten concrete vats that hold some 75,000 gal. These vats are located on both sides of the room—four vats each holding approximately 10,700 gal. on one side and six of about 5,300-gal. tanks on the other. Made of dense cement having a smooth finish, these 8-in.-thick vats are 10 ft. high and 10 ft. deep. Widths vary with the two different sizes.

Interior surfaces are lined with ¼-in.-thick sheets of a special plastic material, applied with the aid of a blow torch to the rough inner surface of the tank. These plastic-coated surfaces are smooth, impervious, and corrosion-resistant.

In front of each vat is an ice-box type wooden door, which is opened after the vats are emptied and ready to be cleaned. Behind each door is a 2-ft. dia. stainless-steel manhole cover that can be opened to permit a worker to crawl into a vat and clean it with hose and water. A calibrated glass liquid-level gage in front of each vat enables the attendants to check the amount of wine in a tank.

Removing Cream of Tartar

The concrete vats have been specially designed for storing chilled wines a few weeks to permit settling of cream of tartar (potassium bitartrate) and cold precipitable colloids and thus prevent deposition of these solids in bottles.

After a wine has gone through the prescribed round of cellar treatments, it is transferred to the insulated concrete vats and chilled from room temperature to about 18 deg. F. by circulating it from a vat through a refrigerating unit and then back to the same vat. Chilling of 5,300 gal. of wine takes about 16 hr.

The refrigerating unit consists of four sections of double tubes—one tube within the other. Wine circulates

(*Turn to page* 168)

MODEL WASTE PLANT: It takes used waters from process . . .

UP-TO-THE-MINUTE treatment plant at Lucky Lager Brewing Co.'s new Azusa, Calif. brewery. Waste moves (arrow) from brewery (small section shown) to pump house (extreme left) where it is started through treating process.

How West Coast Brewery Solved Disposal Problem

Situated in dry-land town with inadequate sewage disposal facilities, brewery built own $225,000 system. Liquid waste clarified, all water reclaimed, sludge dried for fertilizer

C. R. HAVIGHORST
Associate Editor, "Food Engineering"

Having a brewery effluent greater than the sanitary sewage flow of the town in which it is located, and with no public facilities or other means of disposing of it, Lucky Lager Brewing Co., Azusa, Calif., invested $225,000 to build its own waste treatment plant. ■ **This project is attracting attention of natural resource conservationists as an advanced step in salvaging industrially-used waters and restoring them to the natural supply.**

For all of the water remaining from the brewing process is reclaimed. Following treatment, 90 percent of it is pumped from the ponds and sent through a company-built mile-long pipe to diversion boxes of the Azusa Agricultural Water Co. to be used for irrigating purposes. And the other 10 percent—that in excess of the latter company's storage capacity—seeps from the spreading ponds to the underground water table.

Benefits Entire Area

This quarter-million expenditure by Lucky Lager adds another notable voluntary and cooperative move on the part of brewing companies to improve public relations and retain their high industrial standing in the communities in which they are located. This one benefits both the city of Azusa and the citrus growers in the area.

The reclaimed water replaces gallonage formerly pumped from underground aquifers for irrigation purposes. It thus provides an increase in the water company's ability to serve the city of Azusa.

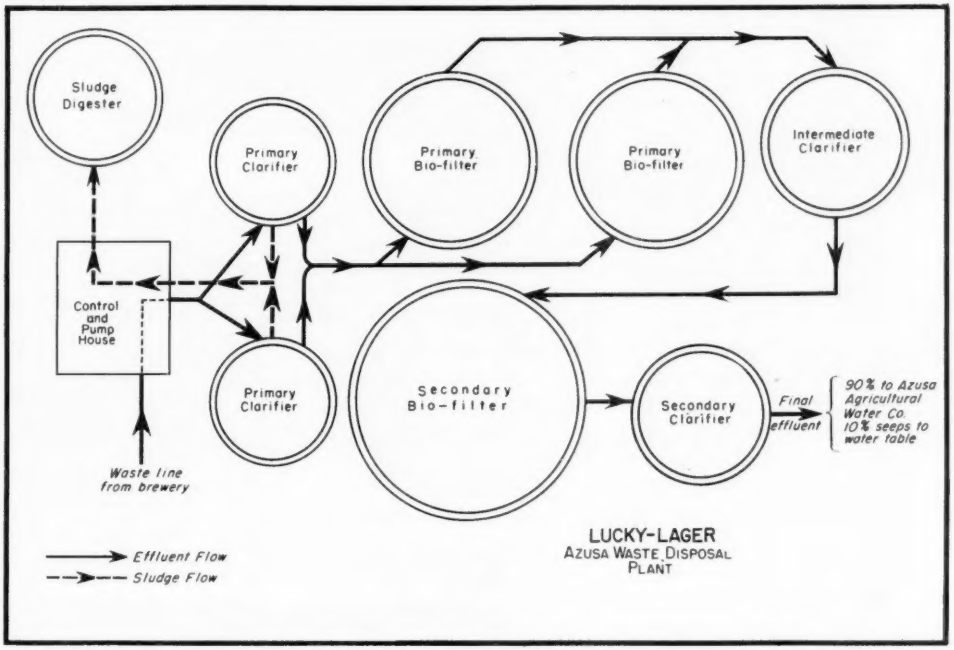
Water From Aquifers

This new 750,000 bbl. annual capacity brewery is in a dry-land location, some distance from the Pacific Ocean. Only the San Gabriel River, a typical southwestern stream that flows only during times of heavy rainfall, is near it. So, there is no available body of water to receive the brewery's liquid waste flow. In addition, all of the water for industry and agriculture for this area comes from underground aquifers. Waste discharged directly to these aquifers would result in their pollution.

New Brewery—New Technics

Waste disposal was not a new problem to Lucky Lager chemists. In the company's San Francisco brewery they had previously developed and

. . . and treats and reclaims them like this



LIQUID WASTE is pumped to primary clarifiers for sludge removal. Effluent then passes through bio-filters and clarifiers to spreading beds. From here, 90 percent goes for irrigation; 10 percent seeps to underground water table.

refined two phases of brewing which added greatly to processing efficiency. As a result—

1—Only 10.5 bbl. of water are required in this brewery's process to produce a barrel of beer. This compares with the national average of 15 bbl.

2—Waste grains are removed from the brewing process more completely than usual. This reduces the amount of suspended solids in the waste water.

This waste treatment plant is designed to cut down the high BOD and relatively high suspended solids from some 670,000 gal. per day of liquid brewery waste. After clarification, the liquid waste is added to the underground water table by means of spreading ponds.

The raw waste characteristics of the 670,000-gpd. flow include 450 ppm. BOD and 250 ppm. suspended solids. It is expected that the ultimate flow from the brewery will be 1,350,000 gpd.

Process Pin-Pointed

The treatment process comprises: (1) Two-stage bio-filtration, with primary, secondary, and intermediate sedimentation tanks; (2) separate, single-stage sludge digestion; and (3) effluent disposal to the local water company and, also to underground gravel beds, by means of spreading ponds.

The two primary sedimentation units are 40-ft. dia. by 10-ft. deep, and each is equipped with continuous circular sludge collectors. The secondary sedimentation units are of identical size. The overflow rate varies from 365 to 731 sq. ft. a day depending upon raw waste pumping operations.

Large Diameter Bio-Filters

The primary bio-filters are 60-ft. dia. with 3-ft. rock depth. The secondary unit is 85-ft. with a 6-ft. rock depth. The average dosing rate for the primary filters is 16,750,000 gal. per acre per day and for the secondary filters the dosing rate is optional at 10,000,000 to 13,500,000 gal. per acre per day.

The sludge digester is 35-ft. dia. by 20-ft. deep. It is equipped with vertical-pipe heat exchangers and a 7,500 gpm. circulating pumping mechanism. The cover is of the fixed-dome type. Gas is collected and used for heating digester contents.

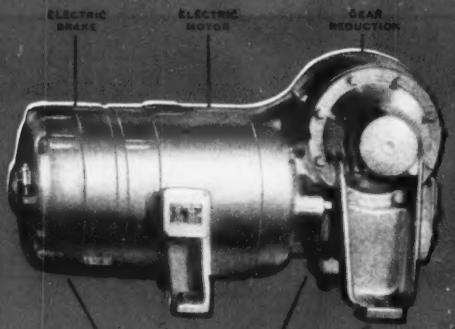
There are five spreading ponds, of no uniform size or shape, covering a total of slightly less than 1 acre. Multiple beds permit resting, drying, and cleaning of ponds. Floors of beds consist of a 4-in. layer of sand over a 2-in. layer of No. 3 crushed rock. Thus, clogging of the natural, tightly packed gravelly subsoil is prevented.

Primary Tanks Remove Sludge

Brewery waste water flows first to the primary sedimentation tanks, where a great proportion of the solids settle out. The fluid is then pumped to the primary bio-filtration unit, where its solids content is reduced by bacterial action. Thence it is pumped to intermediate sedimentation tanks, where solids, accumulated during bio-filtration, are removed.

Solids content is further reduced in the secondary bio-filtration unit. And in the final sedimentation tanks, most remaining solids are removed before the fluid is pumped into the spreading ponds. From the ponds, it seeps through sand into the underground water table.

Sludge is collected from the sedimentation tanks and pumped to the sludge digester. At regular periods, sludge is withdrawn from the digester and pumped to beds, where it is dried as fertilizer.



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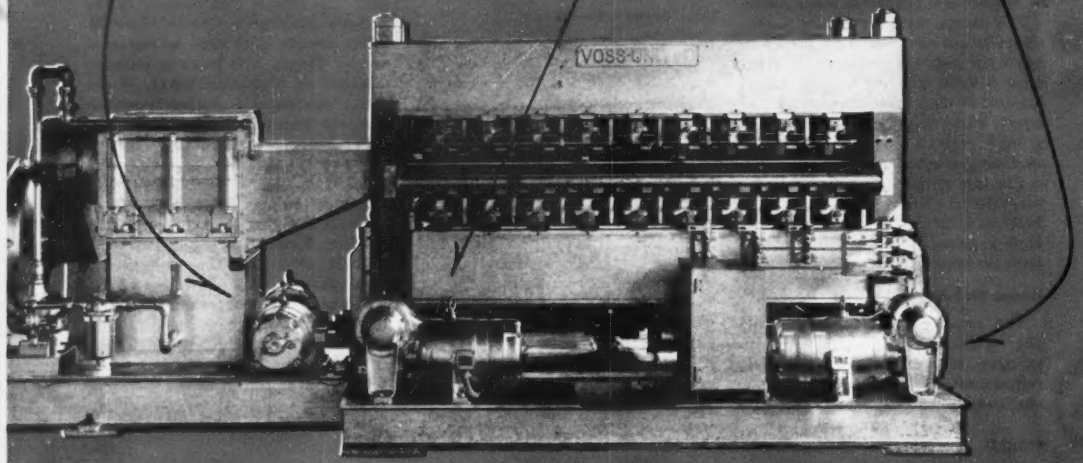

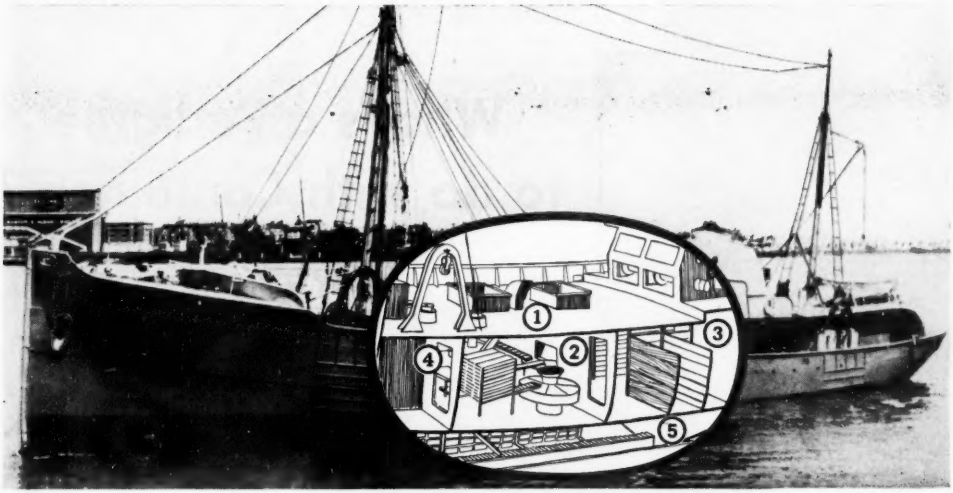

FREEZING PLANT aboard converted trawler "Oceanlife" is revealed in cutaway. Fish are dropped via chute (1) down to processing room (2), with heavy-catch surplus diverted to refrigerated storage (3). After scaling, filleting and packaging, product goes in freezers (4), then to 0-deg. storage hold (5).

FLOATING PROCESSING PLANT

In noteworthy pilot operation, it fillets, cartons, and freezes fish at sea. And top quality packaged product goes to market "the moment she docks." . . . Use of mechanical refrigeration permits long runs to most favorable fishing grounds

H. S. KNOWLTON
"Food Engineering" Correspondent, Boston

The floating frozen fillet pilot plant idea, as here developed and tested by Frozen-at-Sea Fish Corp., Boston, was engineered in the hope of solving two major problems of the East Coast fishing industry.

First problem was how to reach fertile fishing grounds far beyond the rapidly depleting nearby banks and return with a profitable cargo. The other was how to preserve for the housewife the freshness and quality of the fish as it came from the water.

The test ship has not only solved these problems but also demonstrated that even at pilot plant level the entire operation is feasible and economical, pointing to substantial gains from a fullsize commercial operation.

Selected was a diesel powered trawler that no longer could operate profitably on trips to the regular fishing grounds. The vessel is small—150 ft. long, with 25 ft. beam and weighing 370 gross tons.

The pilot plant consists of cleaning and washing equipment on deck and a processing room for scaling, filleting and packaging below deck, adjacent to quick freezing units and a 0 deg. F. storage hold. Equipment is of stainless steel.

Fish, after being caught by trawling, are gutted and washed on deck. Cleaned fish drop by curved chute to the scaling tables in the processing room below. Offals go overboard. When fish are cleaned faster than they can be scaled, a portion can be by-passed to a refrigerated holding compartment (32-to-0 deg. F.) by opening a slide door in the chute (see layout in photo cutaway).

Walls and ceiling of the processing room, like the equipment, are of stainless steel. The floor is made of mastic material.

Fish are scaled by two men using electric scalers. Then they are spray-washed enroute to a circular filleting table. Gurry from the filleting operation is mechanically conveyed to the deck above, and put overboard.

Fillets go to a briner for washing, next are carried along an inspection table to the weighing and packaging table. Here, 5 lb. by weight of fillet are placed in each compartment of the revolving inner section of the packaging table. On the other side, packers take fillets from the compartment, wrap them in cellophane, and place them in a waxed carton in preparation for freezing in the package.

Coming off a roller conveyor, the 5-lb. cartons are placed in aluminum trays, and the trays go into racks for transfer to one of the two plate-type freezers. Here, a charge of 1500 lb. of packaged fillets per freezer is compressed between refrigerated plates for rapid heat transfer. Twelve tons of fillets can be frozen in 24 hr. Freezing requires 2½ to 3 hr. at—40 deg. F. The packages of frozen fillets are packed in cases, 10 to the case, and stored at 0 deg. F.

Boasts Air Conditioning

Refrigeration is supplied by ammonia compressors. Ninety tons capacity is required for quick freezing and holding the 90 ton storage room at zero. The mechanical refrigeration not only supplies adequate refrigeration throughout the trip but in addition provides processing room and

What's a Pedigree to do with Containers?

THE GOLDEN RETRIEVER inherits his canine intelligence and kindliness from sheep-herding forebears. The rich, golden, water-resisting coat, his steadiness and willingness to tackle difficult situations, makes the Golden Retriever a wonderful hunting companion admirably suited to severe cold and icy waters.

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***Corrugated Container Plants:* SAVANNAH, GEORGIA • CHICAGO, ILLINOIS • TRENTON, NEW JERSEY**

1 CHUTED (right) from the deck, cleaned fish are electric-scaled in process room. If they are coming too fast, they are by-passed to storage via diverting gate in chute.

2 CUTTER at work. He wears "cut-proof" mesh gloves on hand holding fish, also safety belt steadying him when ship is underway.

3 FILLETS on conveyor to weighing and packing stations. Side rails keep them on belt in rough weather.

crew quarters with air conditioning.

Before this orthodox trawler was converted to an ocean-going processing plant it employed cargoes of ice for keeping the catches fresh until the return to port. The cruising range of the trawler and length of time at sea was governed by the amount of refrigeration in the ice cargo. Ice was still a part of the cargo when the trawler left the fishing grounds for the return to port. This cut payload.

Weaknesses and hazards were inherent in the old system. If the catch was light at the time there was only enough ice left for the return trip, the Captain would have to choose between making port without profit or even in the red, or risking a longer stay at sea to fill the pens and suffering spoilage losses because of exhausted refrigeration. Even when conditions were most favorable, the first fish caught were as much as two weeks' stale when unloaded in port. Today it's different. Not only do fish from the pilot plant have maximum freshness, but there is no impairment of quality due to piercing of the flesh of the fish by handling-forks.

On the pilot plant trawler, the time cycle from a live fish dumped from the net on deck to fillets in the quick freezer is only minutes. Meaning no time for them to become stale.

The period the trawler can be out at sea is double that of the orthodox fishing boat—ample time to reach fertile fishing grounds beyond the range of regular boats. And on return to port the cargo can be delivered to the warehouses at top quality, frozen and packaged ready for market. Even when a regular fishing boat has a fortunate catch and returns with a full cargo in good condition, the processing plant on shore recovers only 40 to 50 percent of the weight of the fish as fillets—the rest being gurry.

Byproduct Possibilities

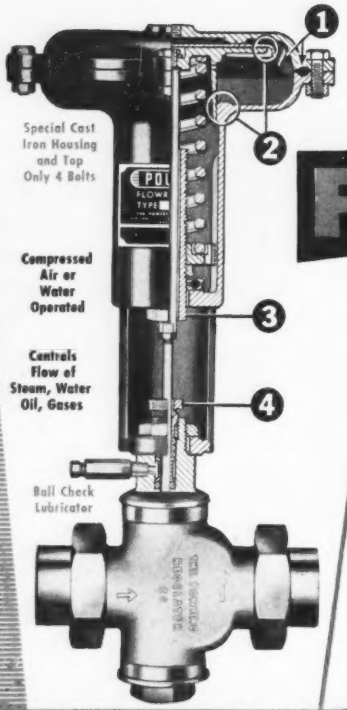
About 60 percent of the catch of the pilot plant ship is discarded as waste at sea. This could be processed into animal food, oil and fish meal on board an ideal vessel designed for processing at sea. The processing capacity of the present pilot plant is 90 tons, worked by 12 of the crew (vessel's crew total is 25). The ideal freezing plant at sea might be pictured as having a capacity of 500 tons of products, requiring 25 plant operators (total crew of 60).

Because of size limitations, the floating pilot plant operation is only a bit above the border line of economy. Nevertheless it has provided facts for establishing a sound commercial operation guaranteeing fish of a quality superior to that produced by existing methods.

4 FIVE-POUND lots of fillets are weighed and dumped into compartments of circular turntable (left) which supplies packers. One man packs for six cutters.

5 A PACKER in action. He cellophane-wraps fillet and places in folding carton on roller conveyor (right) feeding freezing operation.

6 PACKAGES go to freezers in these aluminum trays, which "stay put" in sloping rack when ship rolls.



POWERS **FLOWRITE** VALVE

VALVE TOP—Durable moulded neoprene diaphragm (1) has positive sealing bead which provides increased sealing action with increasing control pressure. Efficient diaphragm form insures ample and constant operating power thru full travel. Piston Plate Assembly (2) has a free floating thrust plate which absorbs side thrust. Closely guided piston plate maintains stem in accurate alignment.

ADJUSTING SCREW—Ball bearing non-rising type. Easily accessible, 180° turning radius with starting pressure adjustable from 0 to 17 psi. Has enclosed rust proofed steel spring for full travel in 5 or 10 psi. control pressure change.

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VARIETY of VALVE BODIES — Sizes ½" thru 8" — For line pressures below 250 psi. Rugged construction to withstand piping strains. Single seat or double seat, bronze and stainless steel trim. Double unions and flanged ends. Available normally open (direct acting) or normally closed (reverse acting) and 3-way type valves.

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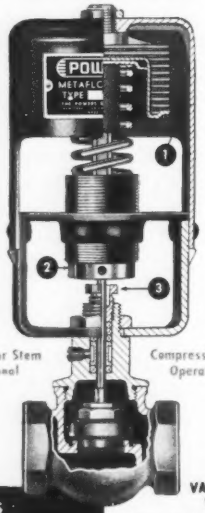

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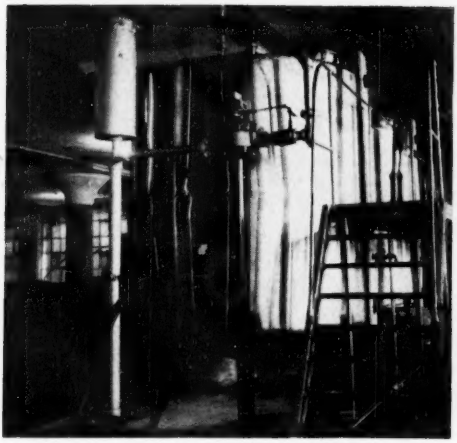
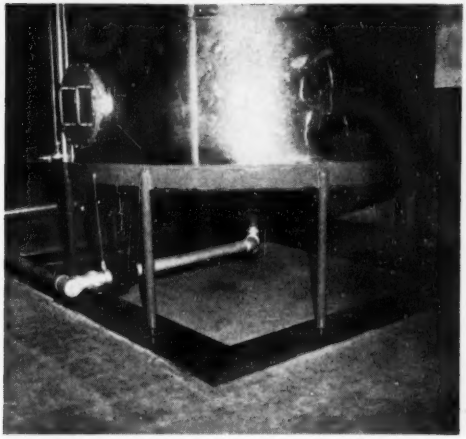


INSTALLING big tanks in restricted headroom is a common puzzler. Nedick's, to solve this one, had stainless steel tanks delivered in sections small enough to clear building openings, then erected them inside.

Floor Bolstered to "Take It"



ANOTHER hurdle encountered in many a building is the floor that won't support the given load. Here, company put steel plates beneath the tank legs (photo), thus safely spread weight over a larger floor area.

Moving to That X-Street Building?

Check These Tips on Making Operation and Structure Fit

Ways to solve problems of setting up food production in an existing building not designed for it are spotlighted by Nedick's recent experience in housing its drink-canning lines

E. F. HANSEN
Production Manager, Nedick's Inc., New York City

Maybe now, or in the near future, you will have the job of setting up a food operation in a building originally designed for *other* purposes.

If so, it's a good bet that you will face a variety of problems—and tough ones—problems you would have anticipated and avoided if the structure were being specially designed for your operation.

Just what are the posers when you tackle such a plant conversion job? And how can they be solved?

Here, the recent experience of Nedick's Inc., in New York City, is in point, and serves to mark the path for others.

What's Faced

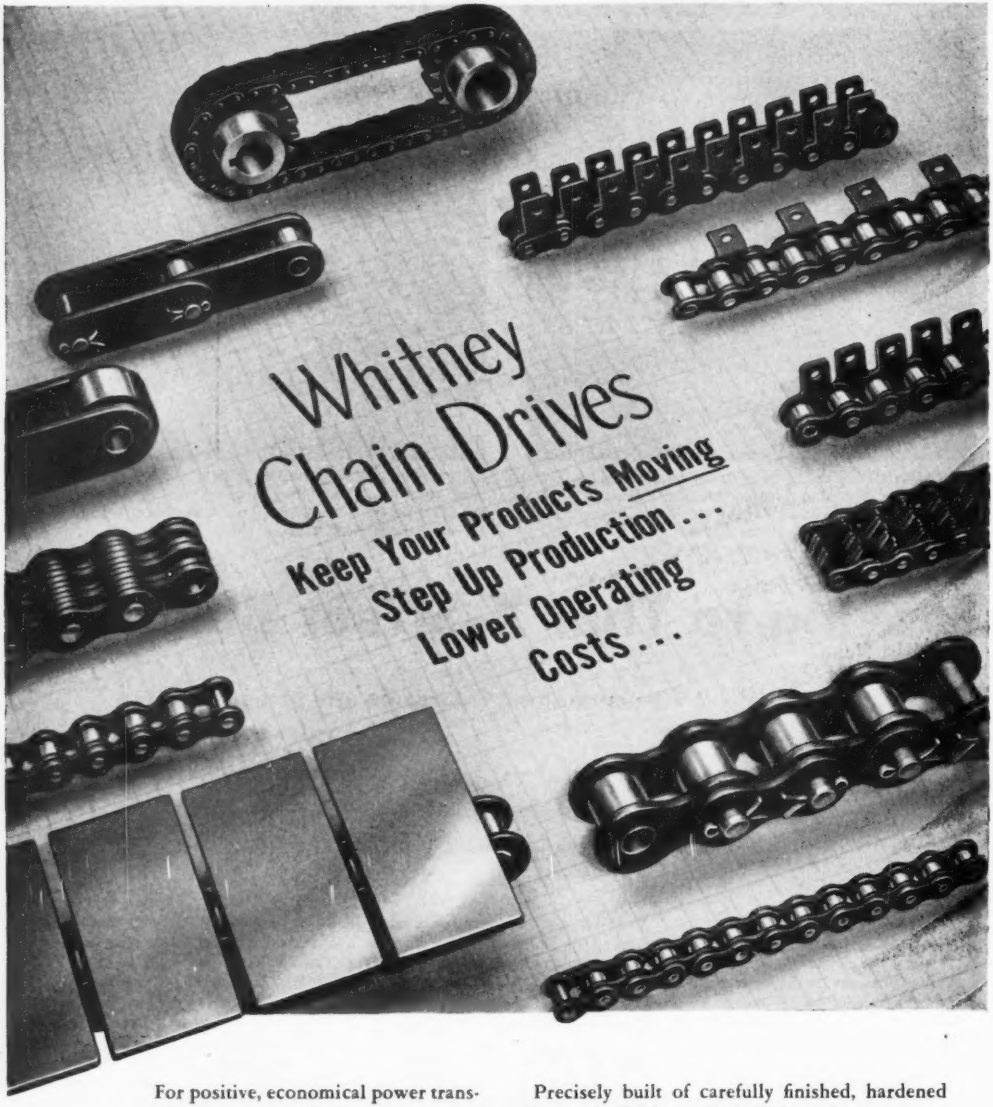
In the general run of buildings, water lines are seldom, if ever, where they should be for food processing. Moreover, they are usually too small in size. Also, boiler capacity in such a building is rarely sufficient, and the steam pressure commonly is too low. Electric lines may be expected to have the wrong voltage and to be insufficient for plant needs. Likely, new conduits must be strung—and where the building structures permit, not where efficient design would locate them. Then, too, the problem of sewage disposal may be a real headache before it is solved.

Not the least of the hard tasks of converting a building into a food processing plant is the planning of the production lines to fit the dimensions of the structure and selection and location of equipment in accordance with the weight limitations of the floors.

These were among the many problems encountered when Nedick's installed a canning plant in the company's warehouse. At first, some of the puzzles seemed to defy solution. But eventually answers were found. And today the plant is smooth-running and efficient.

The conversion program involved installing a facility to process two different products packed into three different size cans. One product was a single-strength orange drink to be packed in both 6 oz. and 46 oz. cans. The other product was a 5-1 orange drink concentrate to be packed in both 6 oz. and 1 gal. cans.

All of the beverages were to be prepared from juice concentrates packed in California and shipped east, under refrigeration in 1 gal. cans. The 1 gal. pack of finished drink concentrate blended from raw concentrated juice was to be the base for the single-strength drink dispensed through the 90 Nedick's stores. Capacity requirements for this product could be planned. The other products were new items to be sold from shelves of retail outlets, mostly self service stores.



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In view of the undetermined market acceptance of the new products, the plant was arranged to have one processing line feeding either of two filling and closing lines—one line filling and closing 6 oz. cans at the rate of 400 per minute, the other filling both 46 oz. and 1 gal. cans. Rate of the former was 35 per min., the latter 22-25 per minute.

With this arrangement one size can may be run to accumulate sufficient inventory before making the change-over. Changing the filling and closing machines for can size, and shifting conveyor and cooler guides requires approximately 16 man-hours.

This operating method was considered more economical than making a large capital investment in processing equipment that would not be immediately put to full use. Space has been provided, however, so that additional processing equipment can be installed to provide two complete lines when needed.

Gallon cans of California concentrate are brought from refrigerated storage by electric fork trucks. Trucks of the 2,000-4,000 lb. capacity were selected because of floor limitations.

Disposal of the empty cans also created a problem due to the mid-city location of the plant. Over 2,000 cans of concentrate are opened in an 8-hr. day. Empties are trucked to the city dump by garbage disposal trucks. This condition posed a dilemma in that (1), a day's accumulation of empty cans would make an unsanitary clutter in the plant, and (2) frequent trips to the dump would be excessively expensive.

This problem was readily solved by making the volume of the cans proportional to their weight. An Economy waste paper baler was installed to serve as a can crusher. Located immediately behind the trough in which the cans are emptied, the baler minimizes the can disposal problem. Now, after the washed empties have drained, they are tossed into the baler, reduced in size and confined. The baling machine was not costly to install, and it has proved economical to operate. Its use has improved plant sanitation and saved many man-hours of time otherwise required for loading and trucking unerushed empties to the dump.

Tank Footings Corrected

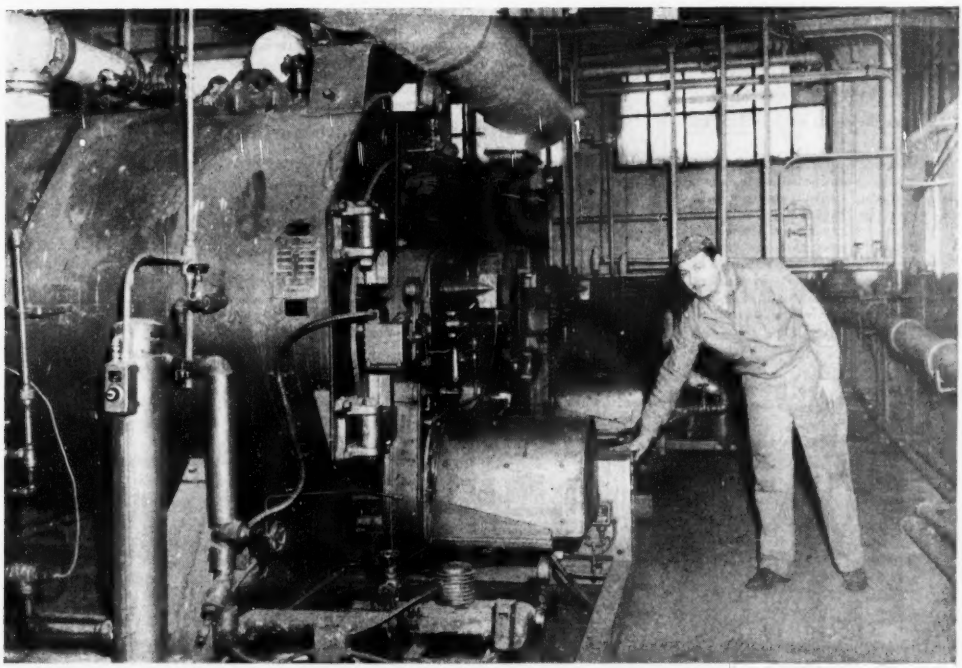
Both the single-strength drink and the concentrated drink base are sweetened with 76 Brix refined sugar syrup, which is metered to the blending tanks. Syrup is stored in four stainless steel tanks, each of 3,000-gal. capacity. The two blending tanks have a capacity of 2,000 gal. each.

Although these tanks were designed to be supported on eight legs, the thrust per leg when the tanks were full exceeded allowable safety limits and city regulations. It was necessary to distribute the weight over a greater area. This was not difficult in the case of the storage tanks. Steel plates, 12 in. wide by 1½ in. thick, were welded into a square footing resting on the floor. These footings are ample for floor safety.

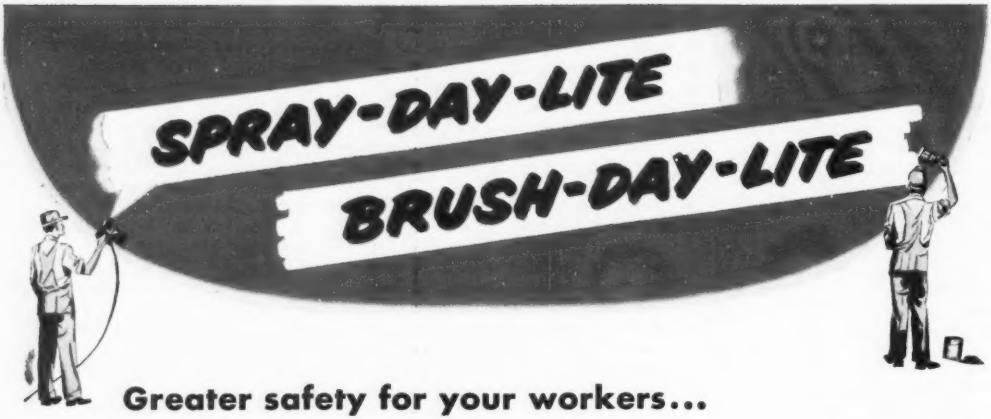
A similiar footing was provided under the blending tanks. But, these tanks are on the processing floor, which must be washed and cleaned frequently. Satisfactory floor washing is very difficult around a 1½ in. steel footing. Loft or warehouse buildings are not designed for washing and cleaning, so it was necessary to lay a new 8-in.-thick floor. This floor, sloped for drainage, was put on top of the old loft floor. Footings of the tanks are covered by the new floor and do not interfere with washing operations.

Before pouring the new floor, two additional tank footings were laid. Uprights from the footings, flush with

Getting Them In Was Tricky



A BUILDING must be studied carefully before bringing in large and heavy units. The beverage maker brought these two packaged, 100-hp. Cyclotherm fully-automatic boilers through the elevator shaft on skids sloped at a predetermined angle.



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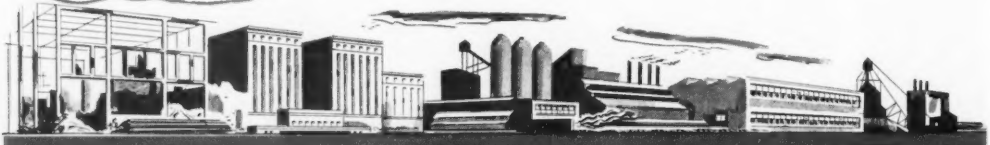

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the new floor, were provided. These are threaded at the top and closed with a removable plug at floor level. Legs of additional tanks can be fitted into these uprights by removing the plugs.

Tank Installation Solved

The accompanying pictures of the syrup storage tanks and blending-storage tanks show the slight clearance between the tanks and the floor and the ceiling. The tanks measure 7 ft. in dia. by 10 ft. in height. The largest opening in the building is less than the tank diameters.

If the tanks had been delivered as finished units, it would have been necessary to cut a hole in the wall of the building to bring them in. It would also have been necessary to cut a hole in the first floor of the building to lower the syrup storage tanks into place in the basement. This would not only have been costly but very difficult with no head space for rig, boom or hoist.

All six tanks were designed for delivery to the plant in sections small enough to clear the building openings. These sections were welded together in the plant. The tanks were then ground, polished, and erected in place. In the end this proved to be a reliable and not too costly or complicated method.

Getting Boilers Into Basement

However, a similar problem, on other units, was far more complicated and seemed for a time beyond solution: Included in the requirements for the canning plant was a boiler capacity of 100 hp. at 120 psi. This was in addition to comfort heating needs. Fully automatic oil burning packaged units were preferred.

For engineering reasons, the logical location for the boiler room was in the basement. Regardless of good engineering practice no other space was available. But there was no access to the basement except by stairway or elevator shaft. It was one thing to join together pre-formed sections of tanks in the plant, quite another to fabricate a steam generating plant inside the building.

The dimensions of the elevator shaft were studied to determine the over-all limitations of stripped boilers which could be lowered into the basement through the shaft way. A shopping expedition followed. Specifications and dimensions were obtained from packaged boiler manufacturers for units of the horsepower required. Two 100-hp. Cyclotherm units met requirements. Either could be used for processing or comfort heating.

When these arrived, they were rolled to the elevator shaft. Here, skids had been placed from the first floor to the basement. The skids were positioned at an angle so that when the stripped boilers were tilted the top of the boiler at the rear cleared the elevator opening, and the top of the front of the boiler cleared the basement opening. In this way, each boiler was skidded into the basement through the elevator shaft and rolled into the boiler room.

Up until the canning plant started operation, all Nedick's orange drinks were shipped single strength from California. When the canning plant was planned, a time was set for the end of single-strength juice shipments and the beginning of the shipment of concentrates. The canning plant had to start running on time.

Even though many of the problems were unforseen and had to be taken in stride, the plant was running satisfactorily five weeks after the equipment arrived. This was within the time schedule as planned.

—End—

What's Coming in Food Engineering

Articles to help you do a better job of producing quality food products at low cost are scheduled by the dozen for the next issues of FOOD ENGINEERING. Here are a few samples:

Special Report on the Latest in Fluid Milk Plants
Important Legal Aspects of Food Plant Sanitation
How to Control Baking Processes Automatically
Production and Packaging of Prefabricated Meats
New Way To Extend Shelf Life of Potato Chips
More Effective Ways to Reclaim Candy Scrap
Freeze-Grinding of Nutmeg in Liquid Nitrogen
How Fishery Plant Generates Chlorine From Sea Water
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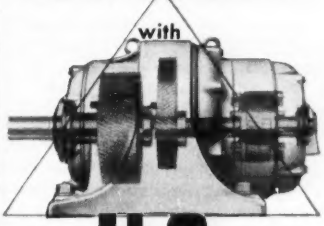
Simplify your power hook-up. Instead of installing a motor plus gear box, extra coupling and belting, select a *U. S. Syncrogear Motor*. The gearing is built-in, completely enclosed, an integral part of the motor assembly. Saves space. Avoids purchase of extra equipment. Most compact.

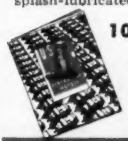
SIMPLIFY with



U.S. SYNCROGEAR —THE INTERNALLY GEARED MOTOR

Pyramidal structure insures maximum stability, permanent alignment. Motor is asbestos-protected. Hardened gears, splash-lubricated. ¼ to 30 h.p.

10 TO 10,000 RPM



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U.S. MOTORS

U. S. Electrical Motors, Inc. FE-6
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Company
Address
City Zone State

Here's how First National Stores
SAVES ON CARTONING

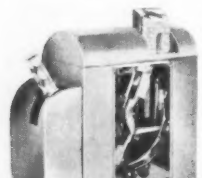
Cartons leave Palmer Carton Former in upright position and are conveyed to filling and closing stations. Packed cartons travel on conveyor in foreground. As illustrated, bar intercepts any carton not closed and takes it out of the line.

Alert, efficient First National constantly strives for cost-cutting methods. Recently, several striking economies were achieved at a single step—adoption of machine cartoning with the Palmer Carton Former.

This widely used machine turns out complete cartons from inexpensive die-cut blanks, offering large savings over factory processed cartons. Additional savings result from reduced labor needs—except for occasional feeding of blanks, no operator is required.

The Palmer Carton Former is adaptable to many different types of cartons, is quickly adjustable for various sizes and has a speed of up to 102 cartons per minute. The cartons it produces are firmly glued, and its specially designed forming plates insure squarely-formed corners and sides free from bulges. You have a container that stands up well in handling, and retains its neat, attractive appearance.

We'll be glad to show you how the Palmer can cut your costs. Consult our nearest office.



Palmer ICE CREAM Carton Set-up Machine

This machine is especially designed for making pint-size Philadelphia-type ice cream cartons. It sets up the carton, locks one end and breaks the opposite flaps for filling. A Palmer CLOSING MACHINE is also available for closing the cartons after they have been filled. Both machines are ready for immediate delivery, so if you are in the ice cream business, consult us at once.

Literature on request

PACKAGE MACHINERY COMPANY • CARTON DIVISION
Springfield, Massachusetts

NEW YORK CHICAGO BOSTON CLEVELAND ATLANTA DALLAS
DENVER LOS ANGELES SAN FRANCISCO SEATTLE TORONTO MEXICO, D.F.

PACKAGE MACHINERY COMPANY

Test Units Nip Shutdowns

—Continued from page 75

A few months later, however, the company decided to "break in" two operating men for this type of work. These men then learned all they could by actually working on instruments. But this was not enough to make them qualified instrument maintenance men. Therefore, they, too, were sent to the instrument company school for thorough grounding in principles of operation, applications, dismantling, reassembling, maintenance and cleaning.

Central Test Lab

By this time the idea of the instrument testing laboratory had further crystallized and, with the war over, the laboratory plan was given the "go ahead." An initial setup followed. But this proved incomplete and a few additions and changes were made.

At each pasteurizing plant, there is a spare flow-diversion valve and a spare instrument of each type. In case of any difficulty, the defective instrument can be easily and quickly removed and the spare installed. The original instrument is then taken to the laboratory, where it is usually placed on a test unit (see lead photo) and the difficulty found and rectified. Occasionally, however, this first test is omitted, and repairs are made immediately.

A stock of parts is carried at the instrument-testing laboratory. With these, quick repairs can be made—saving the time required to get a faulty instrument to and from the manufacturer.

After such repairs, the instrument is placed in its proper working position in the laboratory's simulated operational setup and a test is made to assure that it is in good working order. When returned to the pasteurizing plant, it is installed just before the day's work is begun so that any minor adjustments required can be quickly made before the runs.

Diaphragm valve repairs are also made at the test laboratory. And after repairing, the valve is installed on an air line. The correct pressure setting for the valve spring is determined, as well as the valve travel for open and closed positions. This saves considerable time when the unit is reinstalled, at the plant.

Simulates HTST Pasteurizer

The laboratory unit consists of a double tube heater in which is circulated water (simulating milk). Here there are a hot water heating and circulating unit, a holding system with flow-diversion valve, and necessary instruments, including thermal limit

recorder controller, steam pressure and volume controllers, and sweet water pressure and volume controllers.

Pieces of equipment shown in the photograph (with the exception of the double tube heater) are the spares for the plant in which the instrument testing laboratory is located.

To facilitate quick removal of the flow-diversion valve, the electrical connections are broken, with leads of about a foot. Then, a plug and a receptacle are used.

To eliminate loss of time when changing safety thermal limit recorder controllers, multiple terminal receptacles and plugs are used instead of making connections from wires to terminal blocks as normally furnished by the instrument manufacturer. Average time required to change an instrument with the plug connection is about 20 min., whereas with ordinary connections it takes from 1 to 2 hr., barring any trouble with wiring.

Conversion from terminal blocks to the receptacle connections is made at the test laboratory and tried out to be sure of correct wiring. With these multiple receptacles and plugs, the instrument man alone can make the change.

Temperature Recorders Tested, Too

For checking accuracy of instruments, the unit shown in our second photo was developed. It comprises three 6-in-dia. cylinders mounted on a base fitted with wheels. Steam and water pipes, shown behind the tanks, are easily connecting to existing plant lines. A hand-operated valve on each of these lines controls flow of steam and water to each tank. An overflow is also provided. Below the platform are drains, one for each tank. Agitation of water in each tank is provided by motor-driven paddles.

Recorders are checked for accuracy at 140, 160 and 180 deg. F. by inserting their bulbs in one of the two openings in the top of each cylinder. Water in the cylinders is maintained at the desired test temperature by addition of cold water or steam as required.

Thermometers are tested by insertion in the top openings also. Permanently installed thermometers (seen extending from sides of cylinders) are checked frequently by means of test thermometers known to be accurate.

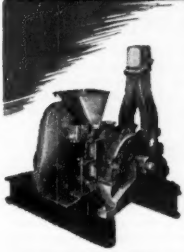
Monthly Tab on Instruments

A program has been adopted whereby control instruments are inspected, checked, and cleaned once each month. As a result, former troubles have been eliminated.

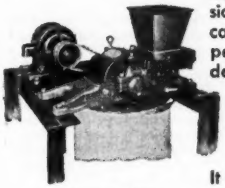
Another feature of the laboratory setup is the training of operators and mechanics. By bringing them here, where breakdown conditions can be

The MIKRO PLAN assures greater Food Processing efficiency

the MIKRO kind of ECONOMY



MIKRO-ATOMIZER
for ultra-fine grinds



MIKRO-PULVERIZER
for granular or fine grinds

THE MIKRO PLAN for Pulverizing Efficiency involves more than a series of custom-built machines. It has been perfected through thousands upon thousands of laboratory tests minutely checked against field performance records over the past 28 years.

This Plan has enabled many food manufacturers, large and small, to improve quality, increase quantity, decrease power consumption (in some cases as much as 75%) and to eliminate such cost and time-consuming items as screening and classifying, duct work, etc.

The scope of the MIKRO PLAN is almost as broad as the Food Industry itself . . . embracing both wet and dry milling. But the proof of its plus efficiency lies in its conspicuous success in handling those products requiring granulation or ultra-fineness, and perfect dispersion of particles. Here are some of the products which can now be processed at much lower grinding temperatures than ever before, as the result of recent developments.

Purees, Nut Pastes, Cocoa Nibs, Flavoring Syrups, Soups, Ultra-Fines for Fondants, Dry Milk, Food Flavors, Spices, Cocoa, Gelatine and other Dessert Mixtures, etc.

It will cost you nothing to find out what the MIKRO PLAN can do for you. Simply submit your problem to the MIKRO Research Laboratory. Our engineers, after preliminary tests, will tell you how the Plan works for you.

Write Today—for your copy of our latest catalog and Confidential Test Grinding Data Sheet

PULVERIZING MACHINERY COMPANY
97 Chatham Road Summit, N. J.

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MIKRO-ATOMIZER
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Also Makers of the MIKRO-COLLECTOR

PRESERVE OUR HERITAGE FAITH FREEDOM AND INCENTIVE

NOW *added versatility for the Beckman Model B Spectrophotometer . . .*

A NEW REFLECTANCE ACCESSORY that simplifies color evaluation

To further increase the wide range versatility of the well-known Beckman Model B Spectrophotometer, a new Reflectance Accessory is now available for use on opaque, colored samples in solid, liquid or powder form. There are many useful applications for this accessory in the precise evaluation and comparison of color intensities and hues.

For example, diffuse reflectance measurements are useful for accurately controlling the whiteness of talc . . . for controlling artificial coloring of foodstuffs such as butter, catsup, and condensed milk . . . for calculation of dye bath recipes in textile processing . . . for grading the color of paper and the whiteness of flour . . . for matching and controlling shades of powder, rouge and lipstick, paints and inks and many other products where accurate color measurements are essential.

SEND FOR NEW BULLETIN

Important features of this new Reflectance Accessory are outlined at right. A bulletin describing the unit in greater detail will gladly be sent. Ask your nearest Beckman Instrument dealer for Bulletin #235—or write direct!

BECKMAN INSTRUMENTS INC

SOUTH PASADENA 18, CALIF.

Factory Service Branches: Chicago • New York • Los Angeles

Beckman Instruments Include: pH Meters and Electrodes—Spectrophotometers—Radioactivity Meters—Special Instruments

Easily Installed

The attachment consists of an integrating sphere in holder and a sliding sample tray which are easily installed in place of the standard Model B sample compartment and cell carriage.

Precise Measurements

To permit utmost measurement precision, a detent mechanism operated by a convenient push button in the sample tray knob exactly reproduces forward and backward position of the sliding sample tray. The resulting precision is particularly valuable for accurate measurements on samples with rough surfaces or non-homogenous colors.

Readings taken rapidly are reproducible to at least 1%—with careful technique even greater precision is obtained.

Operating Convenience

Special provision has been made so that liquid samples can be conveniently inserted without spilling . . . powdered samples without disturbing the smoothed surface.

Sample Size

Sample size is approximately 1" x 1 1/4" with a maximum thickness of 5/16"—ample for most applications. Or, by simply rotating the sphere 180° in its holder, larger samples can easily be accommodated.

Quick, Easy Readings

Accurate color measurements are made with great speed and simplicity. First the instrument is adjusted to read 100% reflectance on a white standard (such as MgO), the sample is moved into position and the percent reflectance (compared to the standard) is then read directly from the meter. It's as simple as that—and the three-compartment sample tray permits quick comparison of two samples and a standard on each run.

simulated, they can be easily taught how to quickly find the defects and repair them. In the course of this work, instruments are fully disassembled and the mechanics are required to reassemble them.

Further use is made of the laboratory units to test any new type equipment submitted.

End (Resume reading on p. 76)

Weigher-Stacker

—Continued from page 95

seals 36 full cartons a minute. Unit is arranged like an elongated wheel with spokes. Every other "spoke" is a rectangle the shape of the carton. Empties are placed on these and are then bottom-sealed. Compressed air blows the empties through a U-shaped tube onto the belt conveyor feeding the matzoth packers at the weigher-sorter. Since the worker's back is to this conveyor, a mirror is conveniently located to enable him to spot pile-ups or other exigencies.

The "spokes" in between are shaped to receive full cartons of matzoth, which are then top-sealed.

Originally, the carton sealer was equipped with a common glue pot setup, in which the roller was partially immersed in a reservoir of glue, carrying along enough to seal the carton. Problem here was that there was always a layer of glue left at night on the roller, and this hardened and was difficult to remove in the morning. In addition, the reservoir of glue itself hardened up. All this added up to a good 10 min. lost each day on each of two sealers.

Remedying this trouble is a newly fabricated galvanized drum placed above the rollers. Hand-wheel diaphragm valves feed just the proper amount of glue onto the rolls. Thus the glue reservoir is eliminated. Any excess glue is caught by a scraper blade and immediately drained off into a catch can. Periodically, the can contents are poured back into the drum. Company finds a 14-in. dia. 10 in. high drum satisfactory. Two valves feed onto two rollers in each of two sealers.

At night, the hand valves are simply turned off. Now, the rolls are easy to get at and clean. In addition, the larger amount of glue in the closed drum does not harden readily.

On their way from the sealer to the wrapper, the cardboard cartons are coded with a kiss-print device of standard design. And after the cartons are overwrapped with printed waxed paper, a simple, self-operating unit codes the outer wrap. A vertical printing wheel that is weighted at one point

near the outer edge is freely suspended. As the wrapped carton, now on its side, comes along, the code is kiss-printed on. After the carton passes, the weight in the wheel quickly brings it back into position ready for the next carton.

About the Product

Matzoth (pronounced mot-sah) is an unleavened bread made of unbleached and unenriched flour mixed only with water. During baking, it rises somewhat like the soda cracker. When cooled, usual size is 6 x 6½ in. Additional varieties can be processed by incorporating eggs (egg matzoth), or shortening and poppy seed (mohn matzoth). These, however, are not used for Passover.

Traditionally, Hebrew people consume matzoth exclusively (instead of regular bread) during the week-long Passover holidays. At this time, sales are 30 times what they are during the year.

The steady year-round line at Goodman's includes macaroni, spaghetti, noodles, dehydrated soups, matzoth meal, and ferfel (matzoth ground a little coarser than the meal).

This company has been doing business in America since 1865, baking the previous 100 years in Germany. It is presently one of the four largest matzoth producers in the country.

End (*Resume reading on page* 96)

Treatment Ups Fruit Life

—*Continued from page* 89

treated showed only 1 decayed orange, while the untreated crate had 62 in which evidence of decay had appeared. A similar test on pineapple oranges (a luscious but more delicate variety subject to quicker spoilage under normal conditions) showed corresponding results. After 17 days the treated crate showed only 2 decay and the untreated crate 88 decay.

Used Commercially Last Year

Having by this time (1950) been satisfied as to the efficacy of its process, the Skinner Machinery Co. felt that it could with confidence offer the process to commercial shippers. About 300 Florida shippers have now used the method, at least on trial shipments. Those who have shipped treated fruit to wholesale markets in New York and elsewhere have received better prices in the auctions because of the superior condition of the fruit when it arrived and because of the knowledge, after one or two experiments, that if prices were not attractive on the day of arrival the fruit

Increase sales appeal
Raise flavor levels . . . with

Huron **MSG**
MONOSODIUM GLUTAMATE 99+%
and
Huron **HVP**
HYDROLYZED VEGETABLE PROTEINS

Increased taste appeal means increased sales appeal. Food processors throughout the country are giving their products taste appeal and more sales appeal through use of Huron MSG and Huron HVP.

The addition of small amounts of Huron MSG and Huron HVP will bring surprising results. No other formula changes are necessary.

MEAT PRODUCTS

Per 100 lbs. of finished product, use 1 to 1½ oz. Huron MSG in fresh pork sausage, 3 oz. in roasted pork sausage, 1 to 2 oz. in #1 weiners and bologna or 1½ to 3 oz. in #2 weiners and bologna (with cereal added.)

In canned meats such as canned hamburgers, corned beef hash, meat and vegetable stew, meat loaf, chow mein use 2 to 4 oz. Huron MSG per 100 lbs. of product.

Our Technical Service Department will be glad to supply further information on the above or other products.

Write us today for samples which will be sent immediately along with specific recommendations.

Huron
MILLING COMPANY
9 Park Place, New York 7, N. Y.
161 E. GRAND AVE., CHICAGO 11, ILL.
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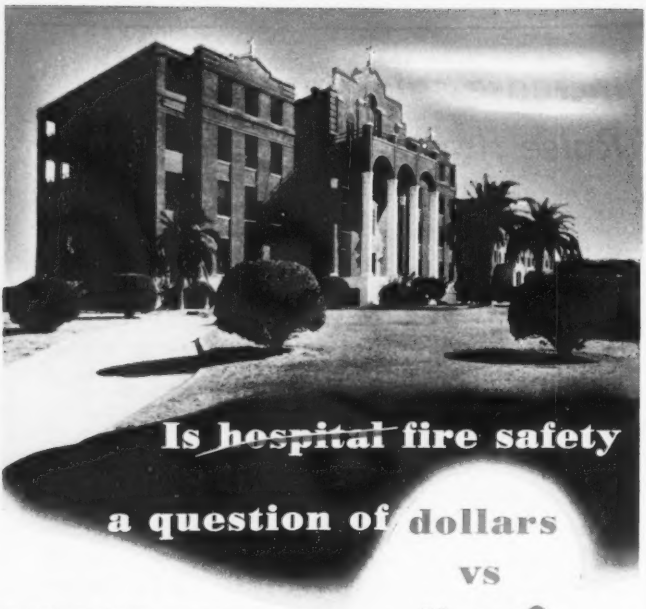


Hotel Dieu Hospital—Beaumont, Texas
Fire Safe with "Automatic" Sprinklers

If fire protection measures are warranted in commercial and industrial structures where dollars are at stake, how much more necessary is every possible safeguard in buildings where helpless lives are constantly in jeopardy?

No building with flammable contents, regardless of construction, is *fireproof.* Only through the installation of *Automatic Sprinklers* can a structure be made *fire safe. Automatic Sprinkler's* record of better than 99% fire extinguishing effectiveness is all conclusive.

You and every other executive with an appreciation of good business logic must not overlook the importance of absolute fire safety, for you can *save lives . . . save property and save money with Automatic Sprinklers.*

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler
FIRST IN FIRE PROTECTION
DEVELOPMENT • ENGINEERING MANUFACTURE • INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

could safely be held over for another day or two for a better market. Citrus fruits have gone as far as Seattle and Vancouver, B. C., without decay.

A typical experience was that of a shipper of tangerines who consigned two carloads to New York at the same time, one treated and one not treated. When they arrived, the market was glutted; but the untreated carload had to be sold immediately for whatever it would bring because it contained 8 to 14 percent decayed fruit.

The other car (treated) showed less than 1 percent decay. It was held for three days, by which time the market prices had greatly improved. It then outsold other tangerines by $1.00 per half strap. The difference in price received for the two cars was then the difference between the low on a low day and the high on a high day, and amounted to nearly $2,000.

Protects Other Fruits

During the 1950 season, treated commercial shipments of peaches, strawberries and tomatoes were made by growers and commission houses in Tennessee, Arkansas, Georgia, South Carolina, and Illinois. Those sent to canning plants or other processors arrived without spoilage. Favorable condition was particularly noticeable in the peaches, which are subject to brown rot.

One shipper of strawberries experimented by simultaneously sending out one treated and one untreated carload. These shipments arrived at the freezing plant together. Treated berries had a mold count of 1 and untreated a count of 24.

On citrus shipments the process is said to have been very effective in checking stem-end decay, which develops under the button of the orange and spreads rapidly if not treated.

A test on tomatoes was made by a processor at Humboldt, Tenn. After 8 days, treated tomatoes were still in good condition, while those untreated were unusable. Since tomatoes require almost immediate processing to prevent excessive spoilage, there would be an obvious advantage to both shippers and canners if a glut of shipments could be held over, in part at least, for another day or two.

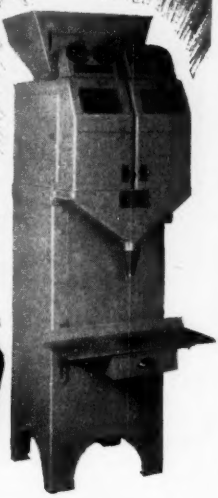
The process liquid is supplied in two different formulas, one for degreening and the other for decay control. The cost for decay control is about $10 to $15 per railroad car, running less for smaller lots.

Although the chemical constituents of the solutions are now on the critical list, no shortage of supply is anticipated because of the vital importance of preserving perishable foods.

End (*Resume reading on p.* 90)

Stops $35.00 "give-away" every day through precision accuracy of

TRIANGLE ELEC-TRI-PAK WEIGHERS



A coffee company in the Southwest was "giving away" an average of 1/8 oz. with every 1 lb. package due to overweights. Now, with Triangle Elec-Tri-Pak Weighers, they weigh and fill packages to an average accuracy of *plus or minus 1/32 oz.* Maximum variation is only 1/16 oz. — underweights are rare. The saving in coffee alone averages *$35.00 per day!* . . . enough to pay for the machine in only 100 days operation.

The new Elec-Tri-Pak machines fill bags, jars, cartons, cans by weight to hairline accuracies like these:

- **Coffee ± 1/32 oz.**
- **Gran. Sugar ± 1/32 oz.**
- **Onions ± 1 piece**
- **Cookies, candies ± 1 piece**
- **Potato chips ± 1/16 oz.**

How much of your product are you giving away? Triangle precision weighers will curb your generosity. WRITE TODAY explaining your requirements. ASK FOR BULLETIN.

TRIANGLE PACKAGE MACHINERY CO.

6659 W. DIVERSEY AVENUE, CHICAGO 35

Sales Offices: New York • San Francisco • Los Angeles • Boston
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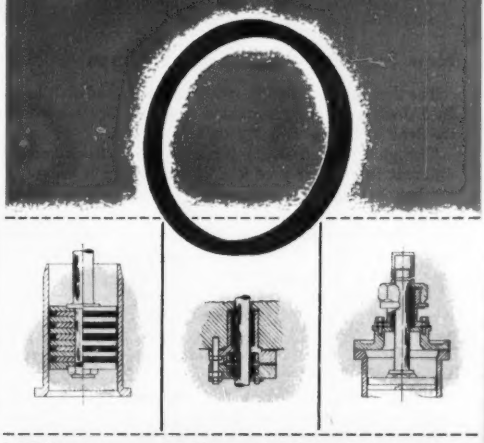
RETAIN PURITY by installing

MORGANITE

SELF-LUBRICATING • NON-CONTAMINATING

PISTON RINGS



IN COMPRESSORS, handling foods, chemicals, plastics, beverages and oxygen.

Completely efficient lubrication is inherent in the rings themselves — no oil or other lubrication is required during the life of the ring. Morganite Piston Rings are non-contaminating and impart no taste or odor. Ideal for compressors in oxygen service. Self-lubricating Morganite is also available in rotary seals, washers, valves, bearings, vanes, and other parts.

CONSULT OUR CATALOG in Sweet's File for Product Designers. Call or write for complete engineering data and recommendations on specific problems. Please supply drawings and specifications when requesting estimates.

See our CATALOG in SWEET'S FILE

REGISTERED TRADE MARK Morganite INCORPORATED

LONG ISLAND CITY 1, NEW YORK

Manufacturers of CARBON MOTOR and GENERATOR BRUSHES, CARBON PILES and SELF-LUBRICATING CARBON SPECIALTIES

NEW PACKAGES & PRODUCTS

New Freezing Process for Shrimps

The first of a new line of frozen seafoods, called "Shrimp-In-A-Jacket," is being marketed under the SeaPak label by the SeaPak Corp., of St. Simon's Island, Ga.

Though a breaded shrimp for home frying, it is completely different from other products. Each shrimp is separate in the box, allowing the homemaker to cook one or a dozen, as she chooses, without thawing and ruining the remainder. Also, these shrimps are not split open or "butterflyed" to increase breading surface. Each shrimp is breaded separately, and no breading is put on the tail.

The result is obtained by a new patented company process. The sequence runs as follows: Fresh shrimps are rushed in ice from the boats to the packing plant, are shelled immediately, deveined, and cleaned under fresh running water. While still cold, each shrimp is pinned by the tail on a stainless-steel pin, where it remains throughout the balance of the processing steps.

Strips of the pinned shrimps are dipped up to the tail in pure milk and egg batter, prepared by the company,

Old Method **SeaPak Method**

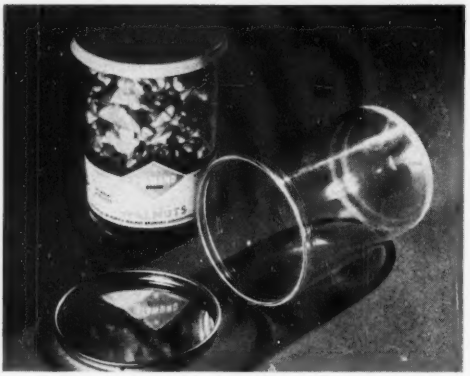
and then evenly dusted with cracker meal on specially designed machines.

Immediately following these steps (they take only a few minutes), the shrimps go to the freezing tunnel, where they are frozen in a matter of moments. After they are hard frozen, they are unpinned and packed into consumer packages.

The product is packaged in 10 oz. chipboard cartons with cellophane overwrap, averaging 19 to 23 shrimp. Gordon Baird Assoc., New York City, and Marathon Corp., Menasha, Wis., are now working on a new label design.

In addition to the "Shrimp-In-A-Jacket," the SeaPak line of frozen seafoods includes cooked shrimps for cocktails and salads, breaded scallops and oysters, crabmeat patties and deviled crabs, kingfish fillets both breaded and specially coated for broiling and sauteing, and a complete Shore Dinner for two people, containing an assortment of products.

Under the brand name of Aerofoods, the company also packs an institutional line of frozen seafoods.



Walnuts in Visual-Plastic Vacuum Pack

Shelled walnuts packed in a visual-plastic vacuum-pack container are now being distributed by California Walnut Growers Assn., Los Angeles.

This container was designed by Southern California Plastic Co., Glendale, Calif. It is made of Styron, a product of Dow Chemical Co., Midland, Mich. The metal cap is furnished by White Cap Co., Chicago.

The crystal clarity of the container combines eye appeal with showcase transparency. It is approximately one-fifth the weight of the conventional containers, and use of the durable plastic reduces possibility of breakage.

Coffee Bags for Individual Service

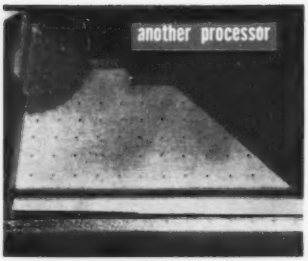
Coffee, which has been marketed in its natural form, ground form, instant type and frozen concentrate, now follows another trend—the individual coffee bag.

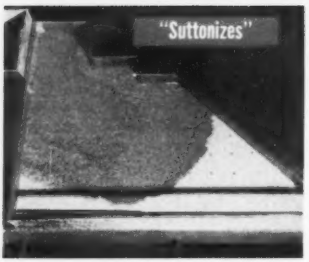
Cup Brew Coffee Bags, on which the patent rights are controlled by the Cup Brew Bag Co., Denver, are used just as tea bags—the bag is placed in a cup and live boiling water is poured over it. Then after pressing with a spoon, steeping is allowed for approximately 2 min.

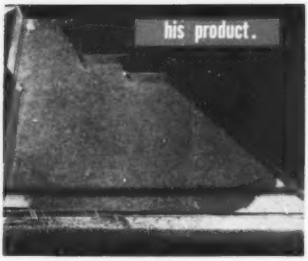
These individual coffee bags are made of Saran film, a product of The Dow Chemical Co., Midland, Mich. It is stated that this material was selected because of its toughness and gas impermeability and because it retains the freshness of the coffee for several months.

John Sexton & Co., Chicago, and Spray Coffee & Spice Co., Denver, are among the firms now marketing this item.

The meticulous work of experienced glass craftsmen has built and is maintaining Armstrong's reputation for top-quality glassware. This skill is available for your quality packages. Contact your nearest Armstrong representative or write to Armstrong Cork Company, 4206 Prince Street, Lancaster, Pennsylvania.







Have you written for your copy of *"Nothing Ventured?"* . . . a folder which describes briefly an opportunity for the imaginative food processor to prove conclusively whether or not the S S & S Process can provide immediate solutions to *specific* separating problems. Free copies, from the second printing, are being mailed to supervisory personnel upon request. . . . Also available is literature giving general information on all models of Sutton Gravity Separators and Air-Float Stoners. (Address Dept. A.)

SUTTON, STEELE & STEELE, INC.
1031 SOUTH HASKELL • DALLAS, TEXAS

SALES AND SERVICE: DALLAS, COLUMBUS, GA., NEW YORK, PITTSBURGH, CHICAGO, MINNEAPOLIS, JACKSON, MICH., DES MOINES, SAN FRANCISCO, TWIN FALLS, IDAHO, FOREIGN: WINNIPEG, CANADA, SAO PAULO, BRAZIL, LONDON, ENGLAND

SUTTON, STEELE & STEELE, INC.

Toasted Coconut In Colors

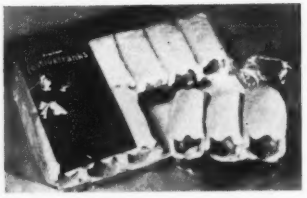
Through a new color plan, colored toasted coconut, is being offered by Wood & Selick, New York City.

In addition to the most popular light, golden and dark shades, other colors include, Yellow Medium Shred, Green Macaroon, Orange Short Shred, Red Long Thread, and Medium Shred Multi-Colored Toasted.

One of the leading manufacturers of coconut, the company now has an ultra-modern, streamlined factory in Cranford, N. J., as well as its completely rebuilt factory in the Philippines.

Because of the varied usage to which toasted coconut is put, the company believed there would be a definite advantage if the trade could purchase the product in a form processed to specific colors to meet particular needs.

The firm distributes toasted, dessicated and sweetened coconut in bulk and package form. The toasted coconut is available in 30-lb. and 100-lb. drums.



Frozen Party-Franks

Appropriately called the "Festive-franks", a frozen food specialty item, consisting of 1 doz. small frankfurters wrapped in dough, is being marketed by Festive Franks, Inc., Harrison, N. Y.

They are packaged on a waxed cardboard strip and overwrapped with cellophane. Complete directions for preparation are given on the back of the cardboard.

Termed ideal for buffet suppers or cocktail Hors d'Oeuvres, they need only be popped into a preheated oven for 15 min. (500-deg. baking for first 10 min., then 350 deg. for last 5 min.)

Hickory-Smoked Flavoring

Devotees of the real outdoor barbecue flavor of foods will find they can achieve the same result on an ordinary inside-home broiler with the use of "Charcrust."

This product, recently introduced by Glen Hall Brands, East Orange, N. J., is sprinkled on steaks, chops, hamburgers, fish and fowl, before broiling to impart a "charcoal broil" hickory-smoke flavor to the food. Although primarily for use in any type of home broiler, it is also finding favor in outdoor barbecue use. It is said not only to give a real charcoal crust but also to tend to seal in the meat juices and prevent meat from drying out while over the embers.

The product is presently packaged in 3 and 6-oz. jars and in trial containers of 1 oz.

Labels are furnished by Arnold Printing Co., New York City. The

3-oz. containers are supplied by Armstrong Cork Co., Lancaster, Pa., and the 6-oz. containers by Hazel-Atlas Glass Co., Wheeling, W. Va.

Lobster Delicacies

Quick frozen stuffed chicken lobster and lobster thermidor are now being sold in several cities on the East Coast by Tony George's Atlantic Lobster House, Charlestown, Mass. Future plans include country-wide distribution.

Freshly caught Maine or Canadian chicken lobsters are split, stuffed, and quick frozen. The lobster thermidor is prepared by cooking under high pressure steam for an average of 23 min. (time depending on the thickness of the shell). The claws are removed, lobster split, meat removed, and shell washed of all tomalley and other remains. Shells are then dried and chilled.

Thermidor filling, prepared according to a special formula, requires about 4½ hr. of cooking. Lobster meat is diced and sauteed in sherry wine, after which it is cooled and injected in the tail and body of the lobster. Then cream sauce filling is poured over it and the final product given a 24 hr. quick freezing.

The baked stuffed lobster is prepared in similar fashion, except that here the claw meat is removed and inserted into the lobster's body underneath the specially prepared stuffing.

Both products are packaged after the freezing process. The lobsters are placed on green waxed paper in a cardboard container and overwrapped with heat-sealed Pliofilm.

POWDERS TABLETS FREE FLOWING SOLIDS LIQUIDS OR SEMI-LIQUIDS

Cut Costs 5-ways on

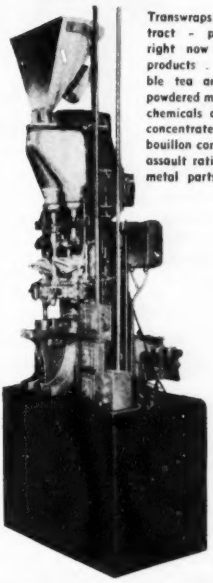
TRANSWRAP

MILITARY PACKAGING

1. *Cuts labor costs*
2. *Improves package*
3. *Eliminates purchase of ready-made bags*
4. *High-speed production*
5. *Versatile*

Metalam*

Transwraps are "contract - packaging" right now on these products . . . soluble tea and coffee; powdered milk; sugar; chemicals and drugs; concentrated syrups; bouillon concentrates; assault rations; small metal parts, etc.



Military packaging calls for rigid observance of delivery dates—and exacting package specifications. You can't afford to overlook slipshod methods and worn-out or inadequate equipment.

Now, as all during the past war, more Transwraps are beating delivery dates and cutting costs—than any other automatic packaging machine. *More*—because experienced packagers *know* that Transwraps are dependable for continuous, cost-cutting production.

Illustration—courtesy Dobeckmun Co.
** METALAM is a Dobeckmun product.*

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Hasbrouck Heights, New Jersey

Tell us your product—and packaging material . . . we'll give you specific data on how you can meet your contract—at lower costs

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☐ Please send your 8-page brochure
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Company .....
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AGITATORS and MIXERS
For the Food Industries
For preparation of food products to high standards of quality, Patterson Agitators and Mixers add the profit-making factors of superior performance and unvarying dependability. Send today for Agitator-Mixer Catalog No. 505.
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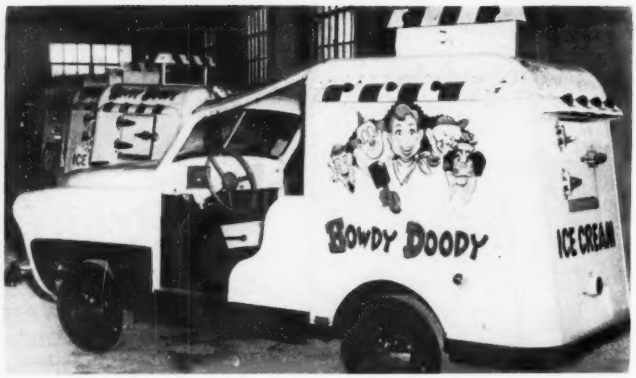

Ice Cream a la TV

Popularity of TV characters, especially with children, is constantly being evidenced in various food promotion tie-ins. Most recent debut is that of Howdy Doody ice cream, coupling the magic of the famous NBC "Howdy Doody" characters.

Over 100 Crosley trucks, now in the metropolitan New York areas, have been especially designed and equipped to handle all of the 22 Howdy Doody items, including stick confections, 4-oz. sundae cups and pints. National distribution is expected shortly.

The small trucks were chosen not only for their low operating cost but also because their small size enable a toy-land appeal to children. The characteristic horn used by the Clarabel character notifies the youngsters that the Howdy Doody ice cream man is around.

This project is under Ice Cream Enterprises, Inc., New York City. Designs for truck and packages are by Kagran Corp., New York City, the Howdy Doody agency. Among suppliers for the cartons are Bloomer Bros. Co., Newark, N. J., American Paper Goods Co., Kensington, Conn.

Cookies In 100% Heat-Sealed Bag

A heat-sealed duplex bag is being used by Southwest Cracker Co., Wichita, Kan., for its line of cookies.

These bags were decided upon after many tests by the package designer, Packaging Prod., Inc., Kansas City, Mo. Protection of the product and its shelf-keeping qualities, as well as attractive and appealing appearance, were sought.

The final package consists of a bag which has an inner lining of Rhinelander Kleerview thermoplastic-coated glassine and an outer lining of Celanese Corp. of America's Lumarith acetate film. This combination gives a moisture-proof bag which is readily heat-sealable. It is 100% heat-sealed, no adhesive agent being used. Also, it retains its original surface smoothness regardless of atmospheric changes that may occur.

SYLPHON CONTROLS FOR DEPENDABILITY

NEW!

SYLPHON No. 999 temperature regulator

MORE POWERFUL • STAINLESS STEEL FRAME FOR MINIMUM HEAT CONDUCTION • LESS HEIGHT AND WEIGHT • LARGE SIZE, 2-PLY SYLPHON BELLOWS FOR ADDED POWER • SELF-OPERATING

THIS NEW ADDITION to the Sylphon line is highly recommended for all industrial processes requiring accurate, dependable temperature control. Particularly suited for storage water heaters . . . metal plating tanks . . . bottle washers . . . treaters . . . slashers . . . etc.

Like all Sylphon regulators, No. 999 is self-powered. It requires no compressed air or other auxiliary power source. It's ideal as standard equipment. Thoroughly dependable. Simple and compact. Sturdily built for long service life.

Also available with fin type bulb for controlling temperature of air or gases. Other models: 999-A has over temperature protection; 999-T equipped with dial indicating thermometer. Write for complete details. Ask for Catalog LG-A.

FIRST WITH BELLOWS

Temperature Controls • Bellows Devices • Bellows Assemblies

FULTON SYLPHON DIVISION

ROBERTSHAW-FULTON CONTROLS CO., KNOXVILLE 4, TENN.

Canadian Representatives, Darling Brothers, Montreal

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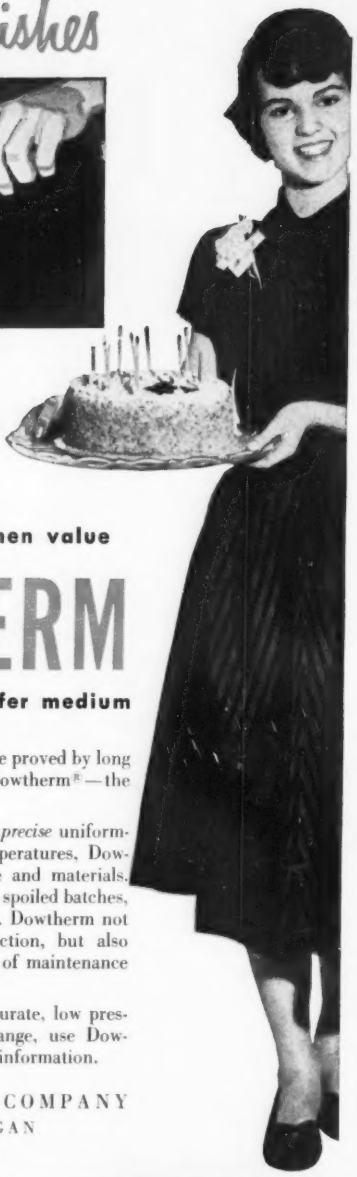

to food!

wide-awake process men value

DOWTHERM

the MODERN heat transfer medium

Process men in many industries have proved by long use the economies offered by Dowtherm® — the *controlled* heat transfer medium.

Operating *at low pressures* and with *precise* uniformity over a wide range of high temperatures, Dowtherm effects vital savings in time and materials. Uniform temperatures put an end to spoiled batches, costly shutdowns and replacements. Dowtherm not only increases quality and production, but also assures efficiency with a minimum of maintenance and operating costs.

Where your operations require accurate, low pressure heating in the 300°-750°F. range, use Dowtherm. Write to Dow for complete information.

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"Tell me more about DOWTHERM."

Name _____ Title _____
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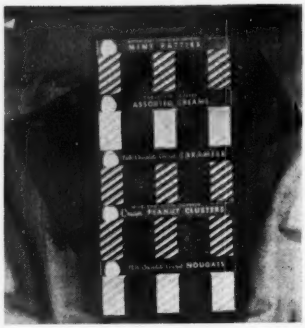
CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE



"Take Home" Candies

For the purpose of attracting more candy consumers through added eye-appeal this "take home"-type package is now offered, consisting of five different confections, each unit-boxed. Maker is Paul F. Beich Co., Bloomington, Ill.

The assortment consists of mint patties, chocolate creams, caramels, nougats, and milk chocolate peanut clusters. Each type of candy is done up in a uniform and colorful box with double windows. These packages were designed by the company's advertising agency, The Biddle Co., Bloomington, Ill. Cartons are supplied by Interstate Folding Box Co., Middletown, Ohio.

Canned Lime Products

Two new lime products have recently been introduced by Florida Tropical Fruit Growers Assn., Inc., Goulds, Fla. Both items are made from fresh, tree-ripened limes.

One is a fresh lime juice concentrate put up in 6-oz. cans. Reconstituted, it makes 1¼ qt. of limeade. Nothing has been added to the lime except pure cane sugar.

This concentrate may also be used to

flavor fruit juices, frozen sherbets, ices and ice cream, mixed drinks, punches, pies, pastries, and other products.

The other product is a 46-oz. can of limeade, consisting of lime juice, sugar and water, ready for use.

Research work in the development of these two items was done by Food Technology Research Laboratories, U. of Miami, Coral Gables, Fla.

Package & Product Shorts

Foil-Wrapped Margarine

With the introduction of its new oleomargarine package, Wilson & Co., Chicago, is making use of aluminum foil. New pack contains four yellow quarter-prints, each wrapped in flavor-protecting aluminum foil. Carton itself is in bright orange, yellow and blue, with brand name and product prominently displayed. It has a die-cut "window" oval on side that exposes two of prints inside package.

Luminescent Packaging Tape

Developed principally for use in blackout areas, a luminescent packaging tape is offered by Century Coating Co., Long Island, N. Y., for use in sealing and marking boxes and containers of all sizes and shapes. It can easily be seen in the dark from a distance of several feet. Fabric tape is coated with Plastisol made from Geon paste resin, a product of B. F. Goodrich Chemical Co., Cleveland. This is stated to insure toughness, to provide resistance to abrasion and chemicals, and to give flexibility in hot and cold weather. It also moisture-proofs the luminescent pigment.

Self-Service Ice Cream Package

A new package idea for a self-service unit of brick ice cream has been made available through E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. It is a direct wrap with flavor identity on a continuous band of cellophane that also serves as an opening tape. The die-cut carton with hinged lid is shaped for placing in the domestic refrigerator ice tray. In addition to brand and general information on the carton, there are suggestions for serving and special dessert recipes on the bottom.

Hermetically Sealed Flexible Pack

Advertised as "a flexible container that gives vacuum pack protection," a new hermetically sealed bag is being offered by American Bag & Paper Corp., of Philadelphia, Pa. Called "Kard-O-Pak," it is a self-opening flat-bottom bag that will stand firm and upright for automatic filling. Construction is of sturdy paper, heat-welded, with hermetically tight plastic enclosure. This type of fabrication and sealing reportedly protects and holds the flavor, aroma and moisture content of such products as coffee, dehydrated foods, dried milk, dried eggs, powders, and frozen foods.

Spices In Capsule Form

Pepper and other liquid spices are now available for commercial use in the form of capsules. Made by "Pilotlab," Evans City, Pa., these items are being marketed under the tradename of "Capsolettes."

Oyster Stew Joins Frozen Food Items

Production of a new oyster stew pack, put up in 1 pint paper cartons for frozen food marketing, has been announced by Union Fishermen's Co-operative Packing Co. and Larson Dairy Co., Astoria, Ore.

—End

NO OTHER STRAINER
YARWAY
IRON
OFFERS ALL THESE ADVANTAGES
A good strainer protects your equipment and pipelines. Yarway gives you a better strainer to "police your pipelines".
• FIRST—The Screen is a high-grade woven monel wire basket that catches solids, lets condensate, oil or other fluids flow freely. Perforated screens if desired.
• SECOND—Screen cap is made with straight thread, machined face and spark plug gasket, insuring tight joint. Screen comes out with cap for easy cleaning . . . automatically aligns when replaced.
• THIRD—Iron and steel bodies are cadmium-plated for protection against corrosion and for better appearance.
• FOURTH—Available in six sizes, from ½" to 2" for pressures to 600 lbs.
• FIFTH—Reasonably priced.
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YARWAY STRAINERS
"Police the Pipelines"

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BEVERAGE QUALITY
cleaning in the food industry
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Protecting Bakery Product Quality with Modern Oakite Sanitation Methods
How to cut sanitation costs in meat packing plants
with OAKITE

4 fact-filled guides to low-cost, plant-wide sanitation—FREE

Now—whether you process meat, food, soft drinks, or baked goods—you can get practical answers to your cleaning problems in these Oakite guides to sanitation. Packed with photographs, diagrams, step-by-step details, they tell

1 **Bottlers** how to get film-free bottle washing, trouble-free machine operation. Sanitary conveyor chain lubrication. Faster, more thorough bacteria and mold control. Quick removal of scale from water-circulating equipment.

2 **Food Processors** how to steam-clean packaging machines, trimming tables, tubs, vats, tanks, conveyors, elevators. Remove grease, stains, tarnish from metal equipment. Chemically sterilize. Remove rust and scale from heat-exchangers.

3 **Bakers** how to clean bread pans, cake and pie tins without spangling or discoloration. Clean aluminum angel food pans without damage. Steam-clean bread and cake racks in half the time. Control mold growth. Remove rust, scale, slime, algae from humidifying equipment.

4 **Meat Packers** how to clean beef kill floors, wooden curing vats, beef chilling vats, cooking kettles. Clean smoke house walls and ducts in half the time, without scraping. Scald hogs without damage to hides, without fouling tanks. Remove scale from water circulating units. Batch-clean 500 trolleys in 1 hour.

FREE booklets tell *all* about floor cleaning, deodorizing, paint stripping, fleet maintenance—other Oakite short-cuts to low-cost, plant-wide sanitation. Write Oakite Products, Inc., 14C Thames St., New York 6, N.Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE

Concrete-Vat Benefits

—*Continued from page* 141

through the inner tube and Freon refrigerant through the outer one.

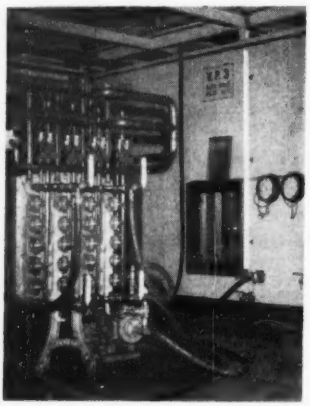
Here's how a new wine is chilled: A centrifugal pump is rolled between the vat and the refrigerating unit, then a rubber hose is attached between the pump and a valve located 6 in. above the bottom of the tank. A second hose is connected to the discharge end of the pump and the refrigerator intake. Still another hose is then attached to hook up the refrigerator outlet with the metal pipe delivering the chilled wine into the top and rear of the vat.

There is a by-pass around the pump, and by regulating valve openings, flow of wine through the refrigerator can be varied. Purpose is to reduce the initial flow for optimum chilling of the wine and then increase it to prevent clogging of the refrigerator tubes by cream of tartar, ice, and other solid matter. Thermometers at the inlet and outlet ends of the refrigerator enable the operator to check the temperature of incoming and outgoing wine.

Precautionary Measures

To keep chilled wines at 18 deg. F., special precautionary measures are taken: (1) Cork insulation is employed in the vats, and (2) temperature recorders are used. Former practice with wooden casks did not include such insulation or recorders.

Installation of a valve 6 in. above the bottom of each vat permits racking (drawing off) of the wine without disturbing the sediment and thus clogging at the outset the finishing or "polishing" plate-and-frame, asbestos-pad filter. A second valve at the very



PUMP circulates wine from vat to heat-exchanger (left) and back to same vat.

bottom of each tank is used to drain cream of tartar and other sediment every time a vat is cleaned and hosed down.

End (*Resume reading on p.* 142)

General Mills' Progress

—*Continued from page* 109

holders throughout the country. These get-togethers were started in 1939, were discontinued during the war, then resumed in the autumn of 1946.

A series of such meetings were held across the country last fall, and about 25 percent of our stockholders attended. The chairman greets each one personally at the door as they arrive, and the entire meeting is conducted in a friendly, informal manner. We tell about the company's operations, answer questions, and try to emphasize the stockholders' responsibilities.

As soon as the name of a new stockholder appears on the records, the president sends him a special letter welcoming him into the General Mills family. The letter includes an offer of a gift box assortment of our products. A letter of thanks from the president goes to each stockholder who sends in his proxy for the annual meeting.

Our stockholders' publication, *Horizons*, reports matters of interest to our stockholders. Through its pages we make a full report of the annual stockholders' meeting, including the minutes, pictures taken at the meeting, and other graphic material. *Horizons* is issued three times a year.

An industrial enterprise should be a "good corporate citizen." It should produce good products at reasonable prices; it should pay its employees fairly and reward its owners with reasonable returns on their investment; it should plan for reasonable progress through expansion, new products, new plants, and betterment of old facilities and products; it should be a part of each community in which it operates plants and offices; it should keep its employees informed about company affairs and encourage them to take part in civic projects; it should strive to be considered a good place to work; it should tell its stockholders about its activities and the public about its policies, products, and plants. I believe that any company which does these things provides the best possible testimony for a free economy.

Vision is the guiding light. Imagination and research define the objectives, and teamwork pulls us toward the goal.

End (*Resume reading on p.* 109)

Depend on
AUTO-LITE
FOR TEMPERATURE INDICATION

Auto-Lite Thermometers are designed to give you the broadest selection for your needs: Priced low and precision-made for accuracy, these instruments point the way to uniformity in processing and help to prevent waste. Write for catalog showing the many styles and types of Auto-Lite Thermometers that are available.

TYPICAL APPLICATIONS: PROCESSING & CHILL ROOMS, FREEZER, STORAGE & CURING ROOMS

Illustrated, at top: Model G Indicating Thermometer, flush mounting type with capillary tubing for remote reading. Priced from $18. At bottom: Model V Thermometer (vapor pressure type). Rigid stem for direct mounting. Priced from $10.25.

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INSTRUMENT AND GAUGE DIVISION, DEPT. F-2
TOLEDO 1, OHIO
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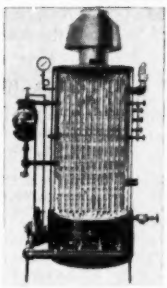
INDICATING & RECORDING THERMOMETERS

FORGET YOUR STEAM PROBLEMS



The KANE Boiler is built to A.S.M.E. specifications, in sizes to 30 H.P.

The M-K-O Automatic Boiler Feed returns condensate and supplies small quantities of hot water as needed to the KANE Boiler.

. . . with
the KANE BOILER PACKAGE

Each KANE BOILER PACKAGE is carefully considered by us as an "individual" job,—from the customer's requirements to the finished unit. And each BOILER PACKAGE is a compact, self-contained steam source that includes: the correctly sized KANE Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and an M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency.

Engineered Steam at its best with four decades of experience at your disposal—so, send your steam problem to us for study and recommendation.

ENGINEERED STEAM AT ITS BEST
MEARS-KANE-OFELDT INC.
P.O. BOX 223 BRIDGEPORT, PA.
FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE

What can make these good foods better?

The foods shown here, like many others, are subject to oxidation during processing. Ascorbic acid will make them better by protecting them from the loss of natural color and flavor which occurs from oxidation. Small quantities of added ascorbic acid will greatly retard this action.

And this valuable vitamin may be added to certain processed foods, such as fruit and vegetable juices, to increase their vitamin value and to allow a label claim for increased nutritional value. The cost is nominal, the processing simple.

When you use Roche ascorbic acid to keep Nature's color and flavor in the foods you process . . . when you increase the nutritive value of your processed foods . . . retail customers like them better and buy more.

We have helped many food processors to make their good foods better and we're ready to help you. Why not investigate the use of Roche ascorbic acid (vitamin C) today?

QUICK FACTS ABOUT ASCORBIC ACID (vitamin C)

as an anti-oxidant. Roche ascorbic acid protects natural color and flavor at low cost—

in frozen apples, apple sauce, apricots, sweet cherries, fruit cocktail, nectarines, peaches, pears, pineapple, fresh prunes (Italian plums), and frozen purees of peaches, bananas, apricots, nectarines and pears in fresh fruit salads in fluid, frozen and dried whole milk in frozen fillets of salmon, mackerel, rockfish, white fish, lake trout and in frozen swordfish steaks in ice cream in packaged beer in citrus oil emulsions.

to standardize ascorbic acid content or increase nutrition value. Nutritionists believe that the public interest is best served when the ascorbic acid content of the following juices is standardized. A label claim for 100% of the minimum daily adult requirement may be made when the juice contains 30 mg. of ascorbic acid. Roche ascorbic acid, pure crystals, U. S. P. quality, is available in three types: Granular, Fine Granular, and Powder for use in raising or standardizing the ascorbic content of these *processed* foods:

apple juice grape juice pineapple juice canned tomato juice (when Federal Standards of Identity permit) frozen, concentrated tomato juice vegetable juice blends cranberry juice peach and apricot nectar canned and frozen-concentrated orange juice canned grapefruit juice canned tangerine juice canned and frozen concentrated orange-grapefruit blend.

VITAMIN DIVISION • **HOFFMANN-LA ROCHE INC.** • NUTLEY 10, N. J.

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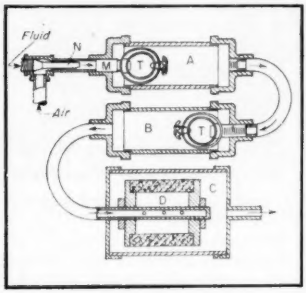
Keeping faith with nature

ROCHE
ASCORBIC ACID

ADVANCES IN TECHNOLOGY



Simplified Aerating Process For Foam-Type Confections

An improved method for manufacturing foamy, aerated confectionery products such as marshmallow and nougat has been patented. The process consists of 3 steps: (1) Mixing of air and liquid by jetting; (2) further mixing by mechanical impingement at high velocity against a fixed target from which it is deflected with considerable turbulence, and (3) a straining and diffusing action through a porous medium.

In operation, the heated liquid confectionery stock, forced through jet nozzle (N) (see drawing above) at high velocity, is mixed with air under pressure in mixing tube (M), then discharges against target-type atomizer (T) in chamber (A). The mixture of air and liquid then moves to chamber (B) where it undergoes a second stage of mixing similar to that in (A). Leaving (B) the mixture passes into chamber (C) and is forced through apertures in the discharge tube into interior of diffusion member (D). This member comprises a pair of end closure dises fixedly mounted with relation to the discharge tube, and a rigid ceramic sleeve characterized by multitudinous fine passages through which the air-liquid mix passes. Having completed the desired aeration, the mix discharges through tail pipe at right.

Digest from U. S. Patent 2,536,340 issued Jan. 2, 1951 on an application dated July 1, 1947, to J. J. Alikonis, Bloomington, Ill., assigned to Paul F. Beich Co.

Adding Modified Soy Protein Improves Marshmallow

Addition of a soy protein or glycinin to the customary marshmallow mix of syrup and gelatin, imparts beneficial properties to the final product. As set forth in patent specifications, the improved marshmallow is more tender at time of manufacture and after long storage; is free from objectionable exudation of liquid droplets on the surface; has greater volume and shows less shrinkage; and remains edible for a much longer time than the standard product.

Modification of soy protein is carried out in a number of steps in which glycinin is isolated and subjected to controlled modification by enzymatic action. Process is carried to the extent of rendering at least 50 percent of the modified glycinin soluble in water at pH of 5.0, with 40 percent of the nitrogen thereof in the form of water-soluble protein nitrogen. Best results in production of marshmallow are obtained when the modified protein constitutes between 20 and 30 percent of the whipping mixture.

Digest from U. S. Patent 2,520,581, issued Aug. 29, 1951, on an application dated Oct. 8, 1945, to J. R. Turner, Ft. Wayne, and Louis Sair, Decatur, assigned to Soya Derivatives, Inc., Ft. Wayne, Ind.

FRUITS AND VEGETABLES

Effect of Flash Sterilization On Color of Tomato Juice

When values $F_o=0.7$ are used, no detrimental effects upon the color of canned tomato juice are produced by flash sterilization at 250-270 F. This conclusion was reached following a number of pilot plant experiments in which each operation closely duplicated that carried out in the average cannery. The tubular sterilizer was a high velocity, ¼ in. dia. tube design. Sterilizing values were as near $F_o=0.7$ as possible. Cooling was effected in an annular space unit mounted adjacent to the sterilizer.

For each experiment, raw stock was divided into 5 lots: Lot 1 was canned at 165 F., processed in boiling water for 35 min., and water cooled to 100 F.; Lot 2 was heated to 205 F., filled at 200, processed in boiling water 10 min., cooled to 100 F.; Lot 3 was sterilized at 250 F. for 42 sec., canned at 200, inverted for 3 min., and cooled to 100 F.; Lot 4 was sterilized at 260 for 11.2 sec., and Lot 5 at 270 for 2.7 sec. Lots 4 and 5 were canned and further treated similarly to Lot 4.

All variables were examined for color 24 hr. after packing, at 1 and 2 weeks, 1, 2 and 3 months. In addition, raw samples were taken from the blending tank and used for initial color standards.

In general, juice originally expected to be borderline fancy was graded within the fancy range throughout the entire examination, irrespective of the processing treatment. And standard juice exhibited a marked improvement in color on storage. Fancy grade juice was graded high in the fancy range initially and remained so.

Digest from "Effect of Sterilization Temperatures on Color of Tomato Juice," by T. E. Blumer, F. W. Parrin and G. T. Peterson. A paper presented at the Canning Problems Conference, National Canners Assn., Convention, Chicago, Feb. 19, 1951.

Set of Pectin Jellies

Jellies made with pectin are known to require a measurable time to set after pouring into glasses and cooling begins. It can be shown experimentally that the temperature at which a pectin jelly sets is a physical property of the jelly, while the time of set depends on temperature conditions. Setting temperatures from 34-99.5 C. can be obtained, depending on the pH of the jelly and the rate of cooling. A jelly of pH 3.30, containing 0.20 percent pectin, and 70 percent solids, set at 66 C. in 28 min. When the cooling rate was reduced from 1.39 deg. per min. to 0.35 temperature of set was 77 C., and 80 min. elapsed before the set began. Increasing pH lowers the temperature of set, a fact some-

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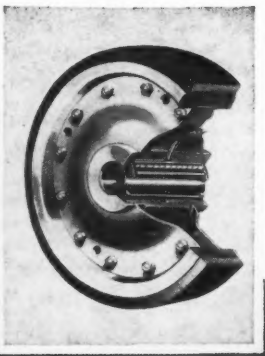
DARNELL

CASTERS & WHEELS

SAVE EQUIPMENT
SAVE FLOORS
SAVE MONEY
and TIME



Pre-tested for Performance

DARNELL CORP. LTD. Long Beach 4, Calif.

60 Walker St., New York 13, N. Y.
36 N. Clinton, Chicago 6, Ill.

times used by jelly manufacturers to delay setting of jellies during packing of them. The setting temperature is not related to jelly strength of the pectin. Soluble solids content, pectin concentration, and buffer action have subsidiary effects on setting temperatures compared to the pH.

Digest from "The Setting Temperature of Pectin Jellies" by C. L. Hinton, *Journal of the Science of Food and Agriculture*, Vol. 1, No. 10, 300-307, 1950.

Canned Orange Juice Flavor Not Protected by Deaeration

Reduction of the initial oxygen content of canned orange juice to a very low level will not eliminate flavor deterioration in storage, nor prevent loss of ascorbic acid. It will, however, reduce the rate of can corrosion and delay development of hydrogen swells.

Three series of test packs of orange juice were prepared; One without deaeration; one vacuum-spray deaerated, and one deaerated by hydrogen displacement. Oxygen content of the canned juices were; 0.5; 0.05, and 0.0005 percent, respectively.

After one month at 86 F. there was no detectable difference in flavor between the 3 treatments—all showed marked deterioration. At 68 F., after 3, 6, and 12 months differences were slight. Inert gas deaeration did not eliminate off-flavor development. Loss of ascorbic acid in packs receiving the first and second treatments and stored at 86 F. were practically identical.

Digest from "The Effect of Oxygen on Flavor Deterioration and Loss of Ascorbic Acid in Canned Orange Juice," by J. F. Kefford, H. A. McKenzie and P. C. O. Thompson, *Food Preservation Quarterly*, 44-47, Sept., 1950.

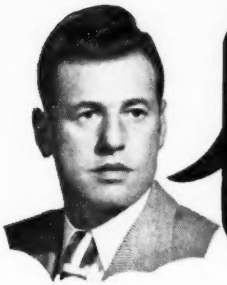
ENGINEERING

New Blanching Device

Designed for application to food processing apparatus, for example a freezing chamber, a patented blanching device provides evacuation of air from blanching chamber prior to beginning of blanching period, and circulation of blanching medium for intimate contact with particles of food under treatment. Various steps of the operation are automatically controlled by a time cycle controller of the rotary drum type, which actuates group of relay valves.

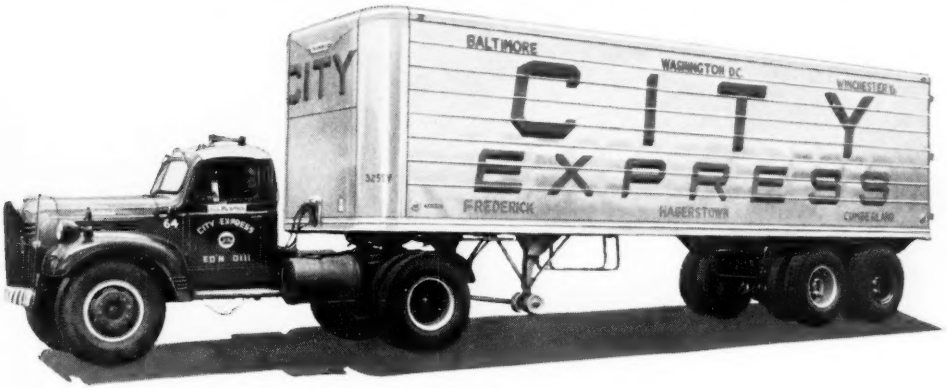
As applied to freezing of food, apparatus comprises a vertical casing transversely divided into blanching chamber above and freezing chamber below. Transverse wall has opening through which blanched food may be discharged into freezing chamber.

(*Turn to page* 177)

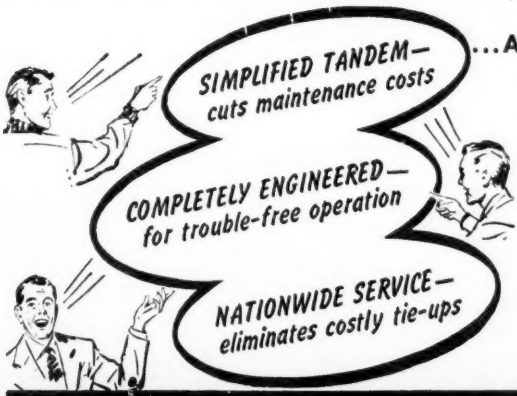


GREATER PAYLOADS... LOWER MAINTENANCE COST with TRAILMOBILE—

Reports Marshall H. Wentz, Pres., City Express, Inc., Baltimore, Md.



"Even After Years of Service, My Trailmobile Units Maintain Their New, Modern, Streamlined Appearance"


SIMPLIFIED TANDEM— cuts maintenance costs
COMPLETELY ENGINEERED— for trouble-free operation
NATIONWIDE SERVICE— eliminates costly tie-ups

...**And, Mr. Wentz** further reports, "The aluminum body makes painting unnecessary, which also helps to increase my profits..." All over America, haulers are enthusiastic in their praise of bigger, more profitable Trailmobile payloads... substantially lowered maintenance costs. Trailmobile eliminates lost revenue due to maintenance tie-ups by providing complete nationwide service maintained by fully trained personnel at all key traffic points. Small wonder the trend is now, more than ever, to Trailmobile!

THE TREND IS TO TRAILMOBILE

CINCINNATI 9, OHIO • BERKELEY 2, CALIFORNIA

4 Keys to self-service

At that final, irrevocable moment . . . when your package faces the shopper with no one to speak for it . . . when the next split second means you win or lose . . . your chances will be a lot better if you have recognized these 4 packaging factors!

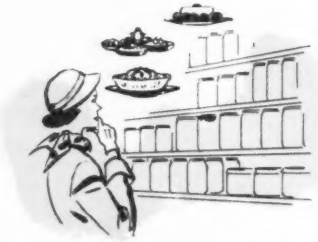
For every package of food, there's a critical moment when one consumer decides its fate . . . when the court of last appeal speaks and the verdict is in.

That moment comes when the shopper's searching eye roams the shelves, and her hand reaches out, hesitates a moment, and then strikes!

At this crucial moment, many forces are at work. But among them all, none is more decisive than four clearly definable aspects of packaging strategy.

Here, then, are four check points on packaging strategy—to be applied to any food package which must face the test of self-service selling conditions:

1 THE POWER TO kindle an idea



One of the healthiest qualities a food package can have is *the ability to spark a constructive line of thought in the shopper's mind.*

A complete menu for a meal can be born in a flash, when a package on the market shelf has the power to start the shopper's mind working.

If a package has the ability *to stimulate appetite*—if it helps the shopper *to see the completed dish on the dining table*—then it is in the idea-kindling class.

But for the most part, a package can't do this UNLESS ITS CONTENTS ARE VISIBLE! It takes the sight of *the food itself* to start the shopper's mind clicking.

The packer who uses Glass+Vapor-Vacuum knows this bit of wisdom—and benefits by it.

2 THE POWER TO attract and compel

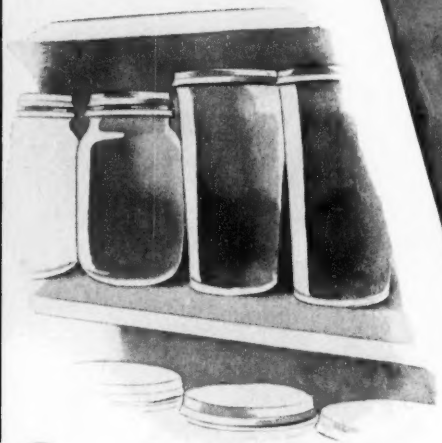
Just attractiveness, alone, isn't enough for the package which must survive in self-service competition. Here, a package must do more than just catch the eye. It needs to attract and COMPEL, too. It must catch the shopper's eye—and HOLD IT, too!

A pretty picture or a nice design can take care of the initial eye-catching, perhaps. But it's not so good for the next step.

That's why it's so necessary to have the contents of the package *visible.* After all, *it's the contents* that the shopper is interested in.

Consider this particular key to self-service selling—and you have another reason why such a huge footage of self-service shelves is occupied by *glass* packages with *Vapor-Vacuum Seals.*

selling!



3 THE POWER TO explain itself

Were you ever in the kitchen when a newly opened package turned out to contain the wrong size or style or form of the product?

This type of tragedy happens—all too often! Especially when shopping is done without the aid of clerks. *But—it NEVER happens when food is glass packed.* Then the shopper KNOWS, at a glance, exactly what she is buying.

In self-service selling, it's the responsibility of the package to speak very clearly. For a happy sales result, *the package must explain itself.* There's no one else around to do the job!

It's this power-to-explain which constitutes one of the chief reasons for the success of Vapor-Vacuum Sealed glass in self-service circles.

4 THE POWER TO inspire faith

Without faith (and a lot of it) *there couldn't be any self-service selling!*

The heart of the whole proposition is the consumer's belief that the package she selects from the shelf will deliver what it promises.

But surely it is futile for any packer to believe that *all* food packages inspire faith in equal measure. There's still a very wide range of consumer response on this point.

It's on this point that Vapor-Vacuum Sealed glass scores so heavily. *The American consumer has learned that there is no safer, surer package than this one!* Literally billions of packages, each year, drive this lesson home over and over in every food store in the land.

Beyond question, no other type of package can do more *to inspire faith* than Vapor-Vacuum Sealed glass.

***"VAPOR-VACUUM"** Seal and Re-Seal*

PRODUCT OF **WHITE CAP CO.**, CHICAGO

"Stretches cloth life with just a handful of CELITE"

From a Celite Field Engineer's report on apple pressing

"THE FOREMAN of this apple pressing plant in my territory is well satisfied with the benefits obtained since they began to sprinkle a handful of a Celite* Pressing Aid on the cloths before pressing.

"Now when the cloths are opened up, the cake snaps out cleanly—they no longer have to beat them with sticks to remove the pomace. Washing is required less frequently, with the net result that cloth life has been greatly increased."

• • •

Longer cloth life is one of several money-saving reasons why more and more fruit processors are using Celite Pressing Aids. Faster production, clearer juice and higher yields are other important benefits that are obtained when these diatomite powders are added in small amounts to the pulp before pressing.

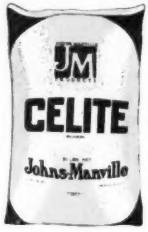
HOW CELITE PRESSING AIDS WORK

The tiny Celite particles, open and porous in structure, interpose themselves between the particles of solid pulp matter. This opens up countless minute channels through which the juice can escape, freely and at lower pressure. More juice is thus extracted in less time. The drier cake is more easily removed and the cloths can often be re-used without washing.

Celite Pressing Aids are used with practically all types of fruit products. No special equipment is needed and the benefits they assure will usually more than pay for the small amounts of powder required.

IF YOU FILTER

Celite Filter Aids can bring you corresponding benefits in faster production, sparklingly clear juices, longer filtration cycles. They are available in 9 grades of particle fineness, each designed for a special filtering requirement. A Celite Engineer will be glad to give you all the facts.



*Reg. U. S. Pat. Off.

For further information, write Johns-Manville, Box 290, New York 16, N. Y.

Johns-Manville CELITE

PRESSING AIDS

Mechanical closures are provided for this opening and for top of casing through which food is introduced into blanching chamber. After a batch of food is introduced and cover closed, air is withdrawn from chamber. Steam is then injected and circulated through blanching chamber for desired period, after which it is cut off. Blanched food is then dropped into freezing chamber for further processing.

Digest from U. S. Patent 2,517,236, issued Aug. 1, 1950, on an application dated July 8, 1947, to J. F. Plummer, Jr., assigned to Ingersoll-Rand Co., New York City.

Double Defecation Process Improves Sugar Yield

Improvement in the defecation of sugar solutions is claimed for a patented process that performs the operation in two steps. In the first the sugar solution is treated with a calcined mixture, principal ingredient of which is a magnesium compound. Enough of the finely ground mixture should be used to raise pH of solution to from 9 to 10. Temperature is gradually raised to between 70–90 C. Bulky precipitate is allowed to settle, and liquor is decanted. Mud is filtered and filtrate added to liquor obtained by decanting. In second defecation, phosphoric acid is used to lower pH to between 5.0 and 7.3, and solution is again heated to 80–90 C. Flocculent precipitate is formed which is filtered, yielding final clear filtrate of the process.

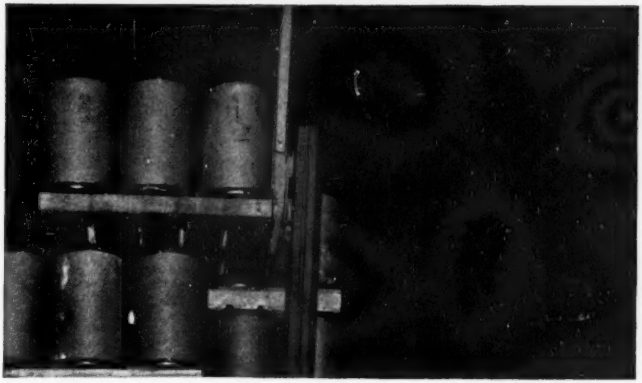
Digest from U. S. Patent 2,515,353, issued July 18, 1950, on an application dated April 11, 1947, to J. J. Naugle, New York City.

FATS AND OILS

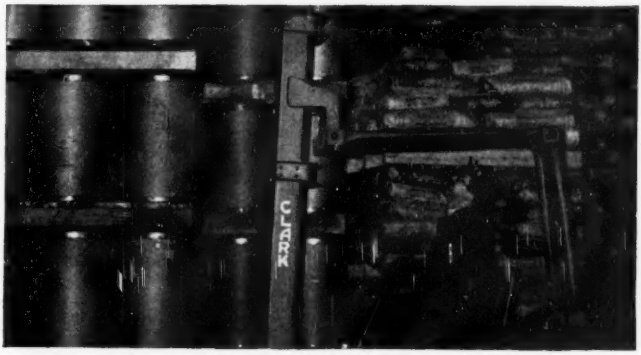
Stabilizing Flavor Of Soybean Oil

When soybean oil is processed in a definite sequence of operations—degumming, distillation of a small fraction of the oil, and deodorization—it has more flavor stability and is less likely to develop off-flavors than oil processed in the conventional manner. As revealed in patent specifications, degumming is done in the usual manner by treatment with water or an aqueous solution of a weak acid or various salts, followed by settling or centrifuging. In the second step of the process, a fraction of the oil is vaporized and distilled in a high-vacuum still, after being degassed. Here a fraction, comprising about 5 per cent of the original oil, is removed at a temperature of 230 C. and pressure of 7-8 microns. In the preferred type of still—high-vacuum, short-path centrifugal—time of exposure is only

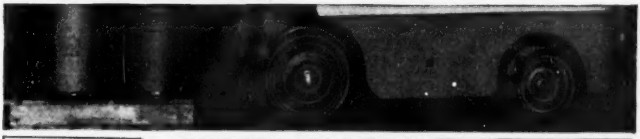
Cash in on overhead-



space, that is — with



Clark fork-lift trucks!



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CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND POWERED HAND TRUCKS · INDUSTRIAL TOWING TRACTORS

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Please send me a copy of your new booklet, "Safety Saves."
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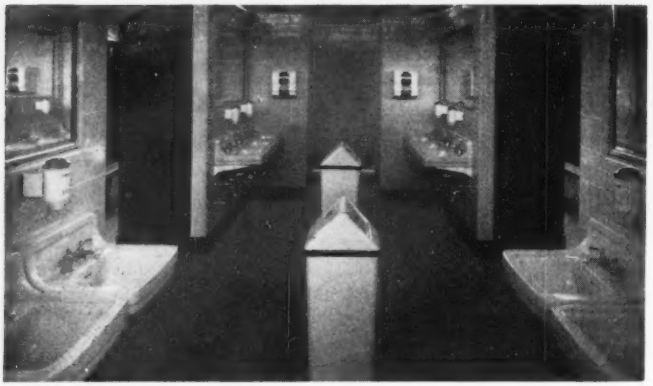
City_____ Zone____ State_____
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

Washroom walls of KRAFTILE Glazed Structural Wall Units at the Torrance (Calif.) Works, American Radiator & Standard Sanitary Corporation. Prack & Prack, Architects.



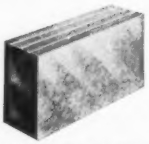
Why KRAFTILE Industrial Walls Have So Many Friends...

★ **MANAGEMENT LIKES 'EM** because first cost is the last cost . . . no painting, no plaster-patching. They keep their good looks for the life of the building—at little or no upkeep expense.

★ **WORKERS LIKE 'EM** because they're clean and sanitary, make attractive working surroundings, and provide excellent light reflection.

★ **MAINTENANCE MEN & JANITORS LOVE 'EM** because they are practically mar and scuff-proof; dirt, grease (even lipstick) wipes off with the swipe of a cloth...yet they can be scrubbed daily with washing compounds or disinfectants without dulling their original beauty.

★ **CUSTOMERS AND VISITORS** get a prestige-building impression of KRAFTILE-walled plants and offices, give credit to shrewd management for good sense in selecting wall material that *makes money* by *saving money* . . . yet provides eye-catching attractiveness in the bargain!



THIS IS A GLAZED STRUCTURAL WALL UNIT—a structural clay tile with a fired-on glazed surface on one or both sides. Available in clear glaze or in attractive colors...a "pre-finished" wall material with these important advantages:

★ **ONE-CRAFT INSTALLATION**—when the mason lays it up, the wall's *finished*—no lathing, plastering, painting!

★ **LIFETIME ATTRACTIVENESS**—never needs painting, can't fade, highly resistant to scratching and scarring. Pencil, crayon, lipstick, grease marks wipe off easily. Unaffected by water, steam, most acids, alkalis.

★ **DESIGNED FOR SIMPLE ERECTION**—wide range of shapes in modular dimensions permits fast installation with minimum of cutting and fitting on the job.

★ **PERMITS STEEL-SAVING REINFORCED MASONRY CONSTRUCTION**—approved installation methods and reinforced masonry will meet earthquake code requirements, use less steel than reinforced concrete!

KRAFTILE CO., Niles, California

( ) *Send my copy of your "Graphic Standards for Glazed Tile"*

( ) *Have your representative call*

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Company _____

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a few seconds. Material removed comprises all the free fatty acids and 65-90 percent of the tocopherols. In the final step, oil is deodorized for 3 hr. at 185 C., followed by 2 hr. at 125 C., under a vacuum of about 10 mm. pressure while oxygen-free, superheated steam is blown through the oil. It is then cooled under vacuum to about 60 C. and packaged.

Digest from U. S. Patent 2,508,919, issued May 23, 1950, on an application dated April 20, 1946, to J. L. Jakobsen. Minneapolis, Minn., assigned to General Mills, Inc.

DAIRY

Dry Milk Yields Protein

Milk proteins containing whey proteins as well as casein can be obtained by either batch or continuous countercurrent extraction of dry skim milk. At the same time a concentrated solution of milk sugar is produced from which lactose may be recovered. A 4-stage process has been worked out on a laboratory scale using 0.25 percent NaCl adjusted to pH 4.1 with HCl and extracting the dry milk with 5 times its weight of the solvent. The extracted solid was 86 percent protein (dry skim milk is about 36 percent protein), and contained 2 percent ash, and 0-3 percent lactose (dry skim milk contains about 53 percent lactose). Phosphate and sulfate extracting solutions gave similar results. Costs of this process remain to be worked out by pilot plant runs. The product obtained, whole milk protein, is new and unique.

Digest from "Milk Proteins and Lactose from Dried Skim Milk" by S. R. Hoover and E. L. Kokes, ERRL, Philadelphia 18, Pa., *Industrial and Engineering Chemistry*, Vol. 42, No. 9, 1910-12. Sept. 1950.

Adulteration of Whole Milk Detected by Simple Tests

Positive detection of adulteration of milk with superheated condensed milk is not easy if the adulterant is carefully reconstituted prior to use. However, the fat to solids-not-fat, and the fat to casein ratios of the cream layer are significant criteria. And, since such adulteration reduces the fat content of the cream layer appreciably, even a Babcock fat test is highly significant.

In a study conducted to investigate possible ways of detecting adulterations of this type, superheated skim and whole milks were reconstituted with water and added to fluid whole milk in amounts ranging from 4.3 to 45 percent. Upon standing 24 hr. at 35-40 F., cream volume increased up to 200 percent, and fat content of the cream layer decreased proportionally. The milks exhibited normal appearance,

flavor, alcohol number, freezing point, surface tension and tyrosine values. The nitroprusside test for sulfide groups, and the Evenson test for bound lactose, were negative for milks adulterated 5 to 15 percent. Microscopic technics revealed no disinguishing criteria in either the mixed milks or cream layers, and sedimentation gave variable results. Several other tests were applied, but it was concluded that the fat to snf. and fat to casein ratios were the two easiest and most reliable indicators. Determinations of the three are relatively simple to make using the Babcock method, Mojonnier or Official procedures, and Walker method, respectively.

Digest from "The Expansion of the Cream Volume of Fluid Milk By the Addition of Superheated Condensed Milk and Its Detection," by A. C. Smith and F. J. Doan, (Penn. State College), *Journal of Milk and Food Technology*, 23-26, Jan.-Feb. 1951.

FERMENTATION

Bottling Unpasteurized Beer

To give unpasteurized beer a shelf life of even 30 days requires care in bottling, including sterile or "practically sterile" filling. Since no bottle washer will always deliver sterile bottles, steam, surfur dioxide, or over-chlorinated water is frequently used. The last of these methods is preferred since only a minute amount of chlorine is left in the freshly rinsed bottle, about 0.00042 mg. if 0.7 ml. of water remains. Treatment with SO_2 can leave as much as 70 ppm. SO_2 in the beer, a quantity sufficient to have a highly noticeable effect on the taste. Katadynized water (silver treated) or ultra-violet light, while effective sterilizers, usually do not have sufficient time to act between bottle washer and filling machine.

Digest from "Sterile Filling," by Karl Fehrmann, *Brauwelt*, 45, 949-52. November 9, 1950.

Yield of Yeast and Its Quality Influenced by Many Factors

In a fermentation vat, the maximum yield of yeast is independent of the amount used for "stock" or "seed." However, a large amount of seed is used to shorten the fermentation time, and avoid the unnecessary multiplication of cells that may injure yeast quality. As soon as the limiting yield is reached there is no point in prolonging fermentation since logarithmic growth has ceased and the increased yield will not be worth the expenditure required.

The reproduction velocity coefficient of a yeast is affected by temperature, and increases up to 27-29 C., beyond

JUST TURN IT

AND GET

BRINE

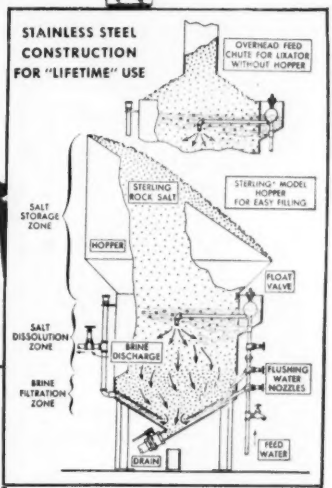
That's Just Right Without Measuring Or Stirring!

STERLING ROCK SALT
BRINE DELIVERED BY PIPE TO EVERY POINT IN YOUR PLANT
• FLAVORING • WASHING • SOAKING
• BLANCHING • GRADING • BRINE PEELING
• ZEOLITE WATER SOFTENERS • PICKLING

• Why trust to "rule-of-thumb" measuring? Why go through the laborious shoveling, hauling, and hand stirring of salt and water? With International's Lixate Process for Making Brine you are assured accurate salt measurement every time. Stops waste through spilling. Saves time and labor.

• The Lixator *automatically* produces 100% saturated, free-flowing, crystal-clear brine which may be piped to as many points in your plant as you wish — any distance away — by gravity or pump. YOU SIMPLY TURN A VALVE to get self-filtered LIXATE Brine that meets the most exacting chemical and bacterial standards.

Savings up to 20% and often more in the cost and handling of salt have been reported by many Lixate users. Why not investigate?



HOW LIXATOR WORKS

In the dissolution zone—flowing through a bed of Sterling Rock Salt which is continuously replenished by gravity feed, water dissolves salt to form 100% saturated brine. **In the filtration zone**—through use of the **self-filtration** principle **originated by International**, the saturated brine is thoroughly filtered through a bed of undissolved rock salt. The rock salt itself filters the brine. Nothing else is needed.

WHAT THE LIXATOR PROVIDES

- ✓ **Chemical and bacterial purity to meet the most exacting standards for brine.**
- ✓ **Unvarying salt content of 2.65 pounds per gallon of brine.**
- ✓ **Crystal-clear brine.**
- ✓ **Continuous supply of brine.**
- ✓ **Automatic salt and water feed to Lixator.**
- ✓ **Inexpensive, rapid distribution of brine to points of use by pump and piping.**

An INTERNATIONAL Exclusive

The LIXATE* Process

FOR MAKING BRINE

*REG. U. S. PAT. OFF.

INTERNATIONAL SALT COMPANY, INC., Scranton, Pa.

Life expectancy

. . . . ZERO!

HOLCOMB SOLVES YOUR INSECT PROBLEMS WITH EFFECTIVE INSECT CONTROL

● You can get rid of insects—*and keep them away*—with Holcomb Insect Control.

Not just a single insecticide, Holcomb shows you how to have effective, year 'round insect control and save money while you're doing it.

Your Holcomb Serviceman will plan a complete control program for you. He'll make sure you get the right materials—*Insekil* for quick knockdowns and kill; *Insecote* where you need the longer-lasting residual spray; and *Hurricane Roach Powder* for fast, deadly action against roaches and waterbugs.

Start your own Control Program now. Just call your Holcomb Serviceman. He'll show your workmen how and when to apply insecticides—and follow up with constant checks to see that your program continues to be effective. *Research laboratory and factory 1601 Barth Avenue, Indianapolis 7, Indiana. Branches in New York and Los Angeles.*

CALL A CLEANING ENGINEER

Your nearby Holcomb Serviceman will come into your plant, make a complete cleaning survey, give you the best recommendations for walls, floors, ceilings, machinery. No obligation, of course.

J. I. HOLCOMB
MANUFACTURING COMPANY

Scientific cleaning materials

which the conditions for protoplasm formation are no longer favorable, and yield falls off rapidly. In nutrition of the yeast there is a departure from the classic closed system, since continuous feeding is almost universally used, and the nutritional environment is made as nearly constant as possible. It is now believed that sugar degradation under aerated growth follows the same path as in fermentation, and that the yeast uses the alcohol thus produced as a source of carbon. Presence of alcohol reduces the value of the reproduction coefficient, however, and for this reason sugar concentration must be kept low. Bakers yeast will respire normally in 2-10 percent sugar solutions, but reasonable fermenter size and the cost of aeration prevent the use of solutions as weak as 0.2 percent. The pH of the medium and its buffer capacity, as well as the oxidation-reduction potential, affect the reproduction rate. Aeration by agitation rather than by injection of air appears to be on the increase in yeast factories.

Limitation on the reproduction of yeast due to the amount present is reduced by the agitation which improves contact between cells and nutrients. Accumulation of toxic metabolic products, increased osmotic pressure of the medium, and the presence of foreign organisms do finally slow down the growth, though the reasons for, and extent of, the effects are not always known. It is important to select a race of yeast of high reproductive coefficient, and low limitation coefficients if maximum yield and quality are to be attained.

Digest from "Yield in Yeast Factories", by Raf. Baetsle and Yvan de Hemptinne. *Fermentation*, No. 6, 151-160, 1950.

FISH AND MEATS

Enzyme System Responsible For Black Spotted Shrimp

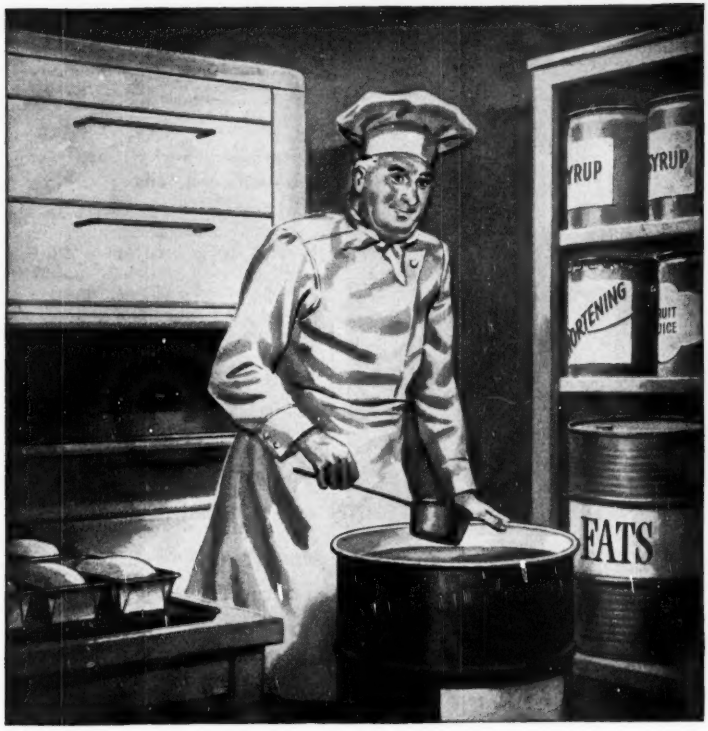
Black spot development in shrimp is due to on oxidative enzyme system, and can be prevented by limiting the amount of air in contact with them. This can be accomplished by packing the shrimp in water and ice and sealing the container. Or, the shrimp may be treated with sodium bisulfite or sodium sulfite (substances for which the air has a greater affinity than the shrimp).

Studies over a 3-year period established the facts that black spots: (1) are not caused by microorganisms; (2) do not result from a chemical change produced by bacteria, and (3) are caused by the action of oxygen upon enzymes present in the tissues of the shrimp. The latter point was con-

Let J & L Steel Drums and Pails

help Your Products Sell Themselves

J&L STEEL



Representative samples of J&L's complete line of steel shipping pails showing (top to bottom) the ring seal, closed head and lug covers.

Your quality product and a J&L container are a combination that you can be doubly sure will catch the customer's eye. Besides affording maximum protection against damage or contamination, J&L Steel Drums and Pails offer an opportunity to add measurably to the sales appeal of your product. Our artists are at your disposal to assist you in creating a distinctive, decorative package.

We can provide all types of Closures, Finishes and Decorations

Heavy-duty ICC Drums	**Light-gage Drums 55, 30 and 15 gal. capacity and 100-lb. Drums**	**Lightweight Drums for Chemical and Powdered materials**	**Steel Pails for Foods, Chemicals Oils—1-10 gal. cap.**

Why not write for a free copy of our booklet "It's Safer to Ship in Steel." It will give you important information on J&L Steel Pails and Drums.

J & L STEEL BARREL COMPANY

A Subsidiary of Jones & Laughlin Steel Corporation

CHRYSLER BUILDING
New York 17, New York

PLANTS

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J&L Steel Barrel Company
Chrysler Building
New York 17, N.Y.

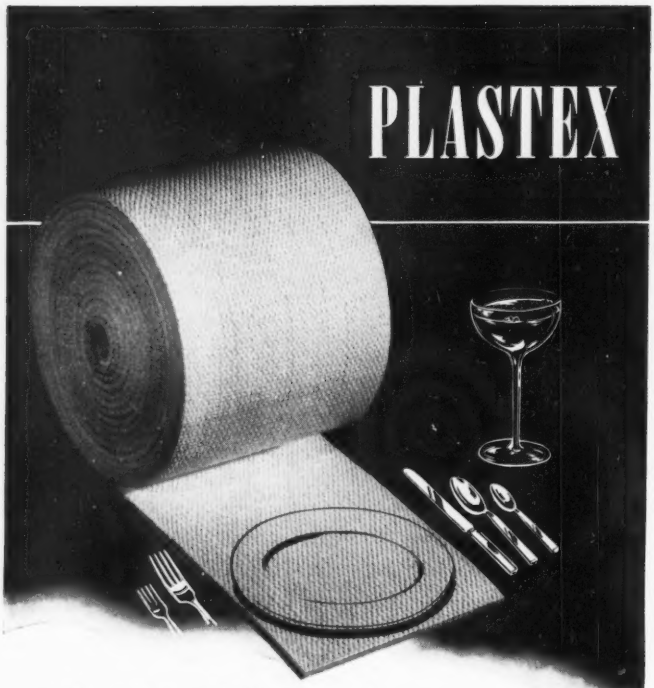
Please send me a free copy of your booklet, "It's Safer to Ship in Steel."

Name_____

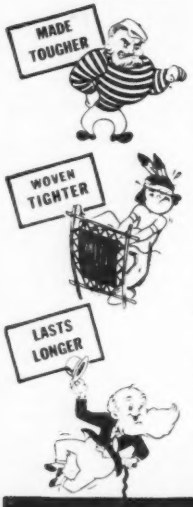
Company_____

Address_____

_____



the food belt that's as clean as your **DINNER PLATE**



Unsanitary handling can ruin your product and your reputation. The cleanliness and "cleanability" of PLASTEX is economical protection. PLASTEX is the famous food conveyor belt that's impervious to all acids, alkalies, oils, greases and moisture. This fully pliable belt can withstand temperatures from —20° to 200° F and won't absorb or exude ANY ODORS. PLASTEX can be easily and quickly cleaned by any method, including steam, and requires no special care.

Basically, this belt is our regular plus-value Solid Woven Cotton Belt that has been covered with a thick, tough coat of plastic that won't crack or peel. That's a combination that defies any and all of the deteriorating elements found in food handling. Acids, alkalies, etc., can't penetrate that plastic overcoat and be absorbed by the belt. That's why PLASTEX is always pure, sweet and clean and will LAST LONGER than any ordinary belt. Ask your mill supply jobber or write us for literature and prices.

BUFFALO WEAVING & BELTING COMPANY
209 CHANDLER STREET BUFFALO 7, NEW YORK
NEW YORK PHILADELPHIA CHICAGO DETROIT SAN FRANCISCO

clusively proven by a series of tests commonly used to establish presence of an enzyme system, and verified by: (1) suspending in water in closed flasks (no discoloration after 125 hr.); (2) suspending in water through which air was bubbled (90 percent discolored in 125 hr.), and (3) substituting pure oxygen for air in (2) (100 percent discoloration in 125 hr.).

Digest from a paper presented by E. A. Fieger, Dept. Agr. Chemistry & Biochemistry, Louisiana State U., Baton Rouge, La., at meeting of Nat. Assn. Ref. Warehouses-RRF., Boston, Mass., Feb. 4, 1951.

Determination of Nitrate In Meats and Soils

A modified brucine method for determining small quantities of nitrate in biological material has been developed, and used successfully in analyzing cured meats and soil. The prior method gave inconsistent results, now shown to be due to instability of the brucine reagent. This disadvantage has been overcome by using a 10 percent solution of brucine in 91 percent ethanol, which has been stored at room temperatures for 12 months without deterioration. Chloride does not interfere seriously, but nitrite must be removed by adding urea and boiling prior to the determination. The dark color formed when organic matter is charred by sulfuric acid is compensated for by appropriate blanks. Inasmuch as less color is developed with ethanol than with other brucine solvents, effective working range of the method is increased about 5 times. Proposed method is equal in accuracy to the gasometric, and is preferable to the phenoldisulfonic acid method.

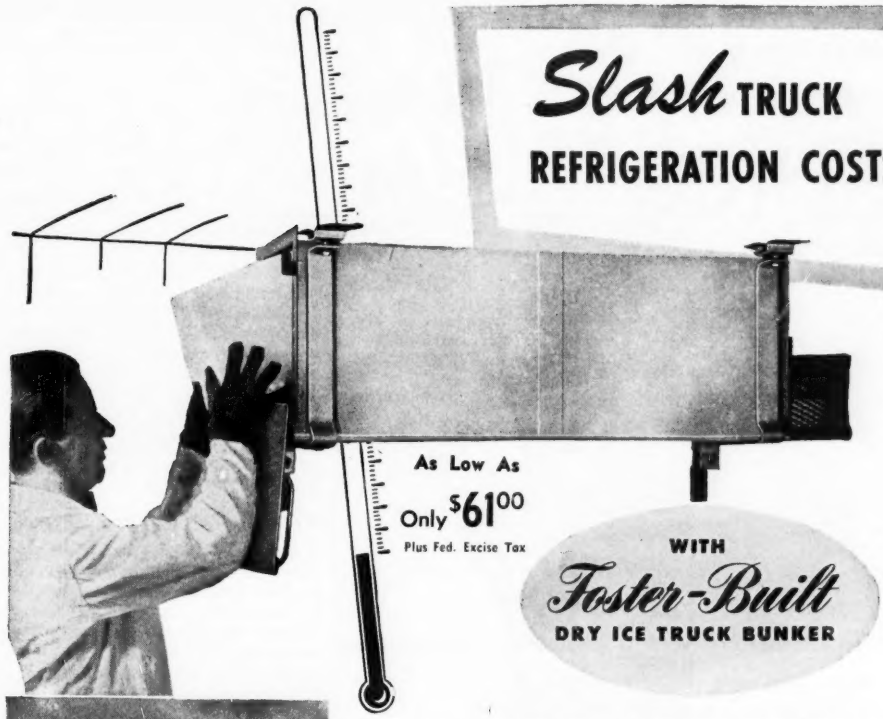
Digest from "A Modified Brucine Method for the Determination of Nitrate," by D. MacDougall and F. E. Roadhouse, *Canadian Journal of Research*, Vol. 28F, 280-286, July, 1950.

MISCELLANEOUS

New Dehydrating Process For Starchy Foodstuffs

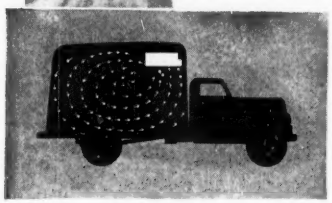
Improvement in the dehydration of starchy foodstuffs, such as potatoes, is claimed for a patented process in which the vegetable is first cooked, then cooled to a temperature of at least 4 C., and finally dried by the application of heat. Cooling or freezing of the cooked vegetable induces segregation of moisture, a substantial portion of which can be removed before drying by heat is attempted. Successive steps can be carried out in a single piece of apparatus; for example, a stationary, horizontal, jacketed drum with suitable connections for steam, hot and cold water, and vacuum, and provided

Slash TRUCK REFRIGERATION COSTS



As Low As Only $61.00 Plus Fed. Excise Tax

WITH *Foster-Built* DRY ICE TRUCK BUNKER



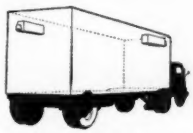
The Super Cold Shot Bunker keeps your wholesale store delivery trucks at proper temperature regardless of the number of door openings.

FOR ROUTE TRUCKS AND OVER-THE-ROAD HAULERS

Refrigeration at rock-bottom cost . . . in truck operation Foster-Built Dry Ice Truck Bunkers are the answer. Light in weight . . . positive performance . . . economical in operation . . . *use the clean dry refrigerant.*

For wholesale store delivery trucks there's the new Foster-Built Super Cold Shot Bunker which provides that quick shot of cold air vital to keeping loads under sustained refrigeration where there are frequent door openings. For longer hauls with few door openings there's the low cost efficient Foster-Built Standard Bunker.

Transport Trucks with Foster-Built Standard Bunkers have gone as long as 60 hours without re-icing. Bunkers are available in 2 and 4-block sizes.



Typical bunker installation in transport truck

FOOLPROOF IN OPERATION

The Foster-Built Bunker is constructed so that the Dry Ice rests directly over a 2-inch bottom air duct. The Dry Ice chills the metal top plate of the air duct, and a low-amperage sirocco-type fan forces the air along the length of the chilled plate, effectively lowering the temperature of the air. The chilled air is then circulated throughout the truck.

IDEAL FOR ALL TRUCK OPERATORS

The Foster-Built Dry Ice Truck Bunker has proved to be an effective, low-cost means of refrigeration for both fleet and individual operators. Units are easily removed when refrigeration is not required and in fleet operation may be moved from truck to truck.

GET THE FACTS . . . MAIL THIS COUPON TODAY . . .
or for immediate action call MOnroe 6-6880, Chicago.

FE

Foster-Built Bunkers, Inc.
757 W. Polk Street, Chicago 7, Illinois

Gentlemen: Please send me fully illustrated, free booklet giving complete information and "case histories" of Foster-Built Dry-Ice Truck Bunkers.

Name .....

Company .....

Address .....

City ..... Zone ..... State .....

manufacturers of
seasoning products should...

taste
test
try

SPISORESINS

The newest advance in the art of
flavoring and the science of seasoning.

Spisoresins are special extractions of dry spices possessing all the flavor qualities and values of dry spices. Spisoresins produce a more uniform and finer flavor than dry spices and are also more economical to use and handle. Spisoresins meet the requirements of the Bureau of Animal Industry.

D&O ESTABLISHED 1796
DODGE & OLCOTT, INC.
180 Variek Street • New York 14, N. Y.
ATLANTA·BOSTON·CHICAGO·CINCINNATI·DALLAS·LOS ANGELES·PHILADELPHIA·ST. LOUIS·SAN FRANCISCO
ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • VANILLA • FLAVOR BASES

with a central rotating shaft fitted with paddles to stir the food mass. A batch of potatoes is introduced into the drum and cooked at a temperature not exceeding 105 C., excess moisture being removed from the drum by vacuum. After the foodstuff is cooked, it is cooled or even frozen in the drum by setting up a high vacuum and, if needed, circulating cold water through the jacket. During the cooling process, the food mass is stirred by paddles into a damp powder, with the accompanying removal of moisture. Subsequent hot drying operation then completes the dehydration. It is claimed that starchy vegetables dried in this manner can be reconstituted into a product superior to that obtained by ordinary dehydrating processes.

Digest from U. S. Patent 2,520,891, issued Aug. 29, 1951, on an application dated Jan. 27, 1948, to Eugene J. Rivoche, Washington, D. C., and assigned to Farmers Marketing and Supply Co., Ltd., London, England.

Water In Refrigerating Systems

Water may occur in a refrigerating system as the result of: Failure to dry the system after assembly; failure to remove air during installation; charging the system with wet oil or refrigerant; mechanical failure of some part of the system, and faulty or careless workmanship. Major troubles arising from the presence of water are corrosive action and freezing in the low side of system, and in the case of halide refrigerants, copper plating. The latter is caused by chemical action on metals containing copper in the low side of the system.

In practice two methods are used for removing or neutralizing the action of any water that may have entered a system: (1) Fitting a tubular cartridge drier in the liquid line, filled with material that will absorb water but have no action on the oil or refrigerant and (2) addition to the system of a liquid dehydrant, or a liquid antifreeze. Among the absorbents used are anhydrous calcium sulphate, activated alumina, and silica gel. A fluid dehydrant of merit is Thawzone which is needed in only small proportions, say one percent of the weight of the refrigerant. It removes water and acid, and its reaction products are harmless. It prevents corrosion and attendant copper plating. Inasmuch as all solid drying agents remove Thawzone to a considerable extent, it is inadvisable to use both a cartridge drier and Thawzone at the same time. It is preferable to install a cartridge first, and after it is removed a charge of Thawzone is added.

Digest from "Water in Refrigerating Systems," by H. L. Skinner, *The Refrigeration Journal*, Vol. 3, 530-43, April, 1950.

—End

Quantity *and* Quality

—Continued from page 84

tions stop. This scale has a 2,000-lb. capacity and eight beams. Its hopper is supplied from ten small-capacity bins.

Panel Masterminds Weighing

All screw feeders serving scale hoppers are controlled from a master weigh-scale panel. This is a one-man supervisory board equipped with a battery of signal lights which show:

(1) Whether bin is full or empty, (2) which feeder is operating, (3) whether scale is full or empty, (4) which beam of which scale is in operation, (5) whether weight added is over or under beam set, and (6) when formula is complete and scale hoppers ready to discharge.

Once the formula has been set up on this master control panel and the beam weight of each ingredient batch fixed, automatic weighing is started by a pushbutton. The operator then merely stands by and watches a series of red and green lights to follow the sequence and to check performance. Green flashing lights identify specific bins and thus tell where material is being drawn from. Red lights indicate empty bins.

Weighing is incredibly exact—the scale tolerance for over or under weight being 1/10 of 1 percent.

All this rapid, meshed activity is accomplished by an electronic nervous system that is soundly engineered and positive in action. In sequences, for example, unbalanced loadings or out-of-kilter formulas are impossible—for the scales are all interlocked and will not operate, should imbalance occur. Also, should any relay component, bin level detector, feeding device, or other such unit, become inoperative, the "fail-safe" electrical network will immediately stop the weighing sequence to allow location of the trouble spot.

The master weigh-scale control panel can be described as the "heart" of the process. For it steadily funnels huge ingredient quantities into the packaged output of the plant. And its repetitive sequences are so precise that the product is "true" down to the smallest sample analyzed.

Mixing Is Next

When the full light on this panel indicates the formula is complete, a "ready" light shows on the mixer control panel two levels below. This is the signal to the operator at this latter panel to "drop" the batch for its mixing sequence.

Improved Mixing....

Self-Rising Flour
Prepared Cake Mixes
Enriched Flour
Ice Cream Mixes
Flavorings
Chemicals
Drugs

with **"ENTOLETER"** *High Speed MIXER*

HOMOGENEOUS MIXING is now obtainable for food products in faster time . . . at less cost . . . with the "ENTOLETER" Mixer. The "ENTOLETER" Mixer is a new-type centrifugal machine designed to provide thorough mixing and blending . . . in faster time . . . at reduced cost. The saving in mixing time is usually accompanied by a smoother, more intimate mix, permitting improvement in product quality. The high-speed centrifugal action thoroughly disperses materials, producing a remarkably smooth textured product. The Mixer is adaptable to continuous or batch processes.

The "ENTOLETER" Mixer requires only 12 cu. ft., with capacity of 12,000 lbs. of finished mix per hour. . . . where beetle or similar insect infestation may be present, this equipment destroys all stages of insect life. Mail coupon today.

ENTOLETER DIVISION
The Safety Car Heating & Lighting Co., Inc.
P.O. Box 904, New Haven 4, Conn.

Please send bulletin describing the "ENTOLETER" High-Speed Mixer

Name.....

Company.....

Address.....

City, Zone and State.....

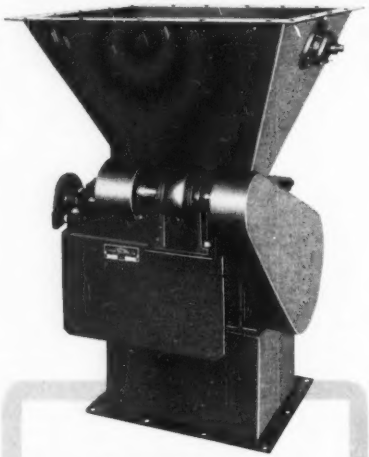
Foreign Distributors: Henry Simon Ltd., Stockport, England

IT'S THE LAST WORD!

For chemical feeding that's flood-proof *and* fool-proof, install the *Omega Rotolock*. This volumetric feeder is the "last word" for feeding dry, pulverized materials which tend to hang up or "arch" in hoppers and "flood".

The Rotolock is a combination of job-proven Omega units. Its feeding mechanism incorporates devices to assure full volumetric delivery at each revolution of the rotor. The famous Omega Variable Speed Drive provides instant and positive adjustment of feeding rate over a 100 to 1 range. Hopper agitators are an integral part of the Rotolock, preventing arching in the hopper and contributing to the high accuracy of this simple feeder.

Whether your feeding problem calls for manual control or for automatic proportional pacing by electrical or pneumatic meters, Rotolock is ideally suited to the service. For complete information and Bulletin 45-G1, address Omega Machine Co. (Division of Builders Iron Foundry), 402 Harris Ave., Prov. 1, R. I.



OMEGA ROTOLOCK

Omega manufactures a complete line of volumetric and gravimetric feeders for dry materials and for gravity feeding of liquids and solutions:

Belt Gravimetric Feeders • Loss-In-Weight Gravimetric Feeders • Universal Feeders • Precision Solution Feeders • Disc Feeders • Rotodip Solution Feeders • Rotolock Feeders • Dust Collectors • Bucket Elevators

B-F INDUSTRIES

OMEGA

The Last Word in Feeders

Ω OMEGA

Each batch of ingredients is automatically discharged from weigh-scale hopper to a surge bin below. All four bins then direct their load through vane type feeders into an 800 lb./min. Redler conveyor. This unit mechanically conveys the material at a fixed speed to air-operated gates above two 900 lb. per min. sifters. Delivery of ingredient batches is synchronized with weighing and mixing procedure before and after sifting.

A power-operated splitter below each sifter directs the batch into jacketed mixers. Here, a time-controlled mixing of ingredients occurs and shortening and liquid flavoring are added. The temperature of each mix is regulated by an indicating air-control thermometer, with bulb directly in the mix.

The mix then drops through pneumatically operated gates to a finish-up mixer below. This mixer thoroughly blends the liquid and dry ingredients to complete the formulation of the batch.

All of the preceding sequence is under the control of one man at the mixer panel board. As in the feed-in area, this panel is also of graphic type, in that all units of process equipment are shown in black miniature on a white panel facing, and there are similar associated lights and pushbuttons. To initiate a mixing sequence, the operator performs the following operations at the panel: (1) Resets the flow meter controller for shortening, (2) opens Redler gates to sifters, (3) observes batch "ready" light, and (4) drops batch from weigh-scale.

A calibrated motor-driven Eagle timer controls sequences in each mixer. It also indicates when the mixing cycle is ready for addition of shortening and/or flavoring.

Mixer sequences are well-safeguarded. In cases of power failure, all panel lights go out and all operations come to an immediate halt. They resume from this point when power returns. Also, if the operation on any mixer line is interrupted by a mechanical breakdown, panel lights will continue to show the status of operations in that line and will hold that status until processing is resumed.

Packed In Multiwall Bags

Discharge from the mixers goes to two 1,800 lb. per min. Redler conveyors on the level below the mixer panel. From here, the mix is dropped through air-operated gates to St. Regis bagging machines on the floor below. These packing units fill six 100-lb multiwall paper bags and five 25 lb. bags a minute. The machines are equipped with weighing scales to guarantee proper fill in each bag and are

fully automatic in their operation—an attendant merely positioning "empties" in the unit and an assistant directing the filled packages into a chute for final handling and palletizing.

At the bottom of the packaged goods chute on the ground floor of the building, finished bags of prepared mix are run onto a conveyor and under a flattening device. Then they pass through an electronic detector which "spots" any bits of tramp metal. And if the presence of metal is indicated the conveyor automatically stops and an alarm sounds. This inspection device is considered one of the most valuable pieces of equipment in the plant.

Final operation is palletizing and stacking of bags to near-ceiling level with a fork-lift truck.

Dust Control Throughout

An integral part of the plant's efficiency is a complete dust-control network. This is comprised of six suction-type systems installed by The Day Co. Dust control extends over all ingredient bins in the tower. In addition, it is also applied at pulverized-sugar bins, sugar storage bins, and the feed-in hopper.

End (Resume reading on p. 85)

Send Up Your Volume

—Continued from page 101

The starch is delivered to an overhead sifter that removes small pieces of candy, lumps of starch, and any foreign matter. Empty trays are replaced on the chain belt for refilling with clean starch and leveling the surface, printing, and depositing.

A continuous unit was devised for sugar-sanding the various shaped starch-jelly candies. This machine comprises two stations—steaming and sugar-sanding. The candies are first carried through a 30-in. wide by 50-ft. long steaming chamber by a heavy-gage wire-mesh belt. Steaming moistens the jelly candies so that sugar crystals will readily adhere to them.

Leaving the steamer, the candies drop into an automatic sanding drum (2 ft. dia. by 5 ft. long, with ½-in. perforations) which applies sugar as the candies travel through. Sugar that does not adhere to the candies is recovered in a floor-level dump bin and then returned to the sanding drum by a vertical bucket conveyor. Sanded jelly gums are placed in wooden trays each holding 6 lb. Trays are then held overnight on dollies.

6—Multiple Packaging

Flexibility is an outstanding feature of the starch-jelly candy packaging

Here's what
IN-PLANT CHLORINATION can do

"Member of National Canners Association"

BAKER CANNING COMPANY

Theresa, Wisconsin

April 4, 1949

PACKERS OF NUMBER 10 TINS
Wisconsin Quality
. . Peas . .
Whole Kernel Corn

Address all Communications to Theresa, Wisconsin

Wallace & Tiernan Co., Inc.
Newark 1, New Jersey

Gentlemen:

We have been using In-Plant Chlorination for a few years, and feel that this piece of equipment is just as important in a canning factory as any other piece of equipment used in the processing of canned foods.

The first year we installed In-Plant Chlorination we had chemists make bacteria counts, and checks at approximately fourteen points throughout the plant, such as picking table belts, flume systems, washers, blanchers, fillers, closing machines etc. In making these tests we did not use In-Plant Chlorination for one week, and the next week we used In-Plant Chlorination in order to make comparisons as to bacteria count.

The reduction in bacteria count, between the two operations is almost unbelieveable. We found that by using this equipment properly, and increasing the dosage at clean-up time, we eliminated bacteria at many of the check points. One cannot, however, install In-Plant Chlorination and forget about a good housekeeping job. This would be an error, indeed.

However, by having In-Plant Chlorination, and doing a good job of house-cleaning, one can eliminate the building up of bacteria in most any piece of equipment. We do find that by using In-Plant Chlorination the clean-up time necessary at clean-up periods is practically cut in half.

You may use this letter in part or in full - for any purpose you care to.

Yours very truly,

BAKER CANNING COMPANY

By Robert Baker

RDB:eal

In-Plant Chlorination, engineered by Wallace & Tiernan, can help your plant, too. Bacterial counts are reduced, odors controlled, and on-the-line time for processing equipment increased when you use this proven method.

Call your nearest W & T Representative now for complete information.

Other services by Wallace & Tiernan Associated Companies include Merchen Feeders for precision blending BY WEIGHT; Richmond Sifters for all separating problems involving powdered or ground materials; and Richmond Permaflux Magnets for the complete elimination of any ferro-metallic contamination of your food line.

WALLACE & TIERNAN
COMPANY, INC.
CHLORINE AND CHEMICAL CONTROL EQUIPMENT
NEWARK 1, NEW JERSEY · REPRESENTED IN PRINCIPAL CITIES

1-33

CM CYCLONE

LIGHT WEIGHT — HEAVY DUTY

High Speed CHAIN HOIST

There's nothing to compare with it! ***63% Less Weight:*** Of Alcoa Aluminum Alloy, the 1 ton capacity weighs only 35 lbs. Carry it anywhere with ease. Designed to stand the "gaff" of maintenance work. ***42% Fewer Parts:*** Long service life. ***96% Efficient:*** Lifts loads rapidly with easier pull on the chain. ***Herc-Alloy Flexible Load Chain:*** America's first welded alloy steel chain. ***Sealed-in Lifetime Lubrication:*** No attention required. ***Low Cost:*** No more than heavy old style chain hoists. Capacities: ¼ to 10 tons.

CM PULLER

The tool of a thousand uses for lifting, pulling, skidding, stretching, straightening. Use it vertically, horizontally, diagonally... any angle. Eliminates the dangers of makeshift methods. Holds the load where you leave it. Compact, light weight... the ¾ ton capacity model weighs only 13 pounds. Herc-Alloy flexible load chain. Labor saved more than repays initial low cost. Capacities: ¾, 1½, 3 and 6 tons.

LIFTS OR PULLS AT ANY ANGLE

YOUR LOCAL CM DISTRIBUTOR carries the CM Cyclone and the CM Puller in stock. Phone him for a demonstration in your plant.

CHISHOLM-MOORE

HOIST CORPORATION

(Affiliated with Columbus McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

SALES OFFICES: New York, Chicago and Cleveland • Distributors Everywhere

department, where four different packages are put up.

On the line turning out the 5¢ Rainbow jelly candy, production increased over 25 percent following the installation of a cardboard boat-forming machine, chain-belt conveyor, and cellophane-wrapping unit.

Formerly, girls formed the boats, assembled the five flavors (lime, lemon, orange, cherry, and anise) into them, and then overwrapped the boats.

Today, roll-fed cardboard is cut to length and automatically formed into a boat by machine-creasing two sides. Boats are automatically fed onto a chain-belt conveyor that carries them, lug spaced, past the assembling station to the wrapping machine. On the assembling line, each of five girls packs one piece of candy of a different flavor into a boat as it goes by them. Girls pick the gum jellies from 30-lb.-capacity bins directly in front of them. After the boats are filled, they are machine-wrapped and heat sealed in cellophane. Rate: 60 units per min.

Transwrap machines package 1½-oz. of small jelly gums at the rate of 60 bags per minute. Gum drops fall through a hopper to the machine, which feeds cellophane from rolls and automatically forms the bags. This unit then fills the measured amount of candy into each bag and heat-seals it.

Packaging of 1½-oz. of gum drops in cartons at the rate of 120 per minute is accomplished with two U. S. Automatic Machinery Co. units. These machines automatically extract flat cartons and open them, and bottom flaps are then closed by a rotary tucker. Next, roll-red waxed paper is cut to size, formed, and inserted into each carton.

Filling is done volumetrically by pairs of buckets mounted on a crosspiece between two chains that carry them through a supply hopper, up past a rotary leveling brush, and then down into a feed hopper. From the feed hopper, the gum drops are automatically filled into wax paper-lined cartons. Finally, the top of the liner is machine-folded, and the top flaps of the cartons are then closed.

Candy-coated licorice gum drops are packaged by two Amsco Packaging Machinery Co. units at the rate of 40 per minute. The gum drops are delivered into a vibrating hopper that carries them forward into an adjustable rotating hopper, divided into two compartments. Connected to this hopper is a weigh beam which scales 8 oz. of candy in each compartment. As the hopper rotates, the candy is discharged into a filling spout. An attendant places a window-carton over the filling chute to collect the gum drops.

End (Resume reading on p. 102)

Squeezing Extra Profit

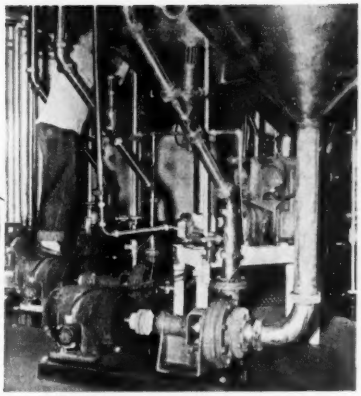
out of the orange concentrate business

It's a remarkable product—this orange concentrate . . . a boon to housewives, a welcome relief to household budgets, and a vast market for the enterprising producers.

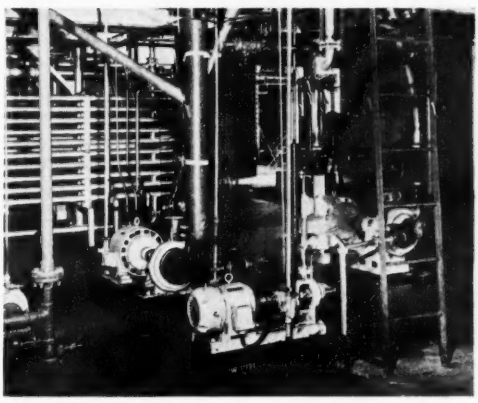
As might be expected, these producers have selected the most advanced equipment in order to produce at lowest costs—maximum profit. Included are Worthington Worthite Centrifugal Pumps with mechanical seals. Many installations in Florida and California are now in their third season, continually providing worthwhile savings through:

- Exceptional resistance to corrosion—no repairs or shutdown.
- Maintained high vacuum—no air in-leakage.
- Easy cleaning, without opening for steaming—by circulating the cleaning chemical through the evaporators.
- Low power consumption for circulating the heavy viscous concentrate.
- Quiet operation without cavitation with unusually low required NPSH.

First cost is low, too. Investigate Worthington Worthite Pumps for *any* acid or alkali applications—weak or strong. Worthington Worthite Pumps are built in standard sizes, from 1 to 20,000 gpm. For further proof that *there's more worth in Worthington*, call our nearest District Office or write to Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, New Jersey.



FLORIDA CITRUS CANNERS COOPERATIVE (Lake Wales, Fla.) uses Worthington Worthite Pumps (mechanical-seal type) to circulate concentrate in a Mojonnier Bros. evaporator, 29.5" to 29.7" Hg vacuum, where fresh, depulped orange juice is concentrated at low temperature to ⅛ its original water volume. These pumps are now in their third season without repair.



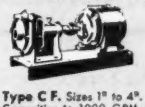
MINUTE MAID CORP. (Plymouth, Fla.) installation uses Worthington Worthite Pumps (mechanical-seal type) on this Buflovak Evaporator. Large pumps in rear circulate the orange juice, small pump discharges concentrate through Rotameter from 29.5" Hg vacuum to holding tank under atmospheric pressure.

WORTHINGTON

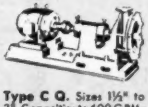
C.I.3

THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB

Types C G and C G L. Sizes ¾" to 10". Capacities to 5000 GPM; heads to 200 ft. Liquid ends of WORTHITE alloy.



Type C F. Sizes 1" to 4". Capacities to 1000 GPM; heads to 130 ft. Standard, all iron and all bronze.



Type C Q. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller. WORTHITE shaft and fittings.

Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage volute. For general service.

Ask any Dietitian—she'll tell you

"Enriched Foods and Fortified Foods are *Preferred* Foods"

AMERICAN dietitians and nutritionists long ago added their endorsement to the Bread and Flour Enrichment Program. And again they have been proved right by the results of the large-scale Newfoundland Nutrition Surveys.

These authoritative surveys reaffirmed that enriched and fortified foods promote better bodies, *healthier* bodies, sharply reduced infant mortality, lower tuberculosis and over-all death rates—improvement in both the quantity and quality of life.

When you enrich and fortify with Merck Vitamin Products you *know* that the faith of millions of Americans is fully protected. Merck Vitamin Products come from the same organization that pioneered in the research and large-scale development of thiamine, riboflavin, niacin, vitamin C, and other important nutrients. And now, the most recent contribution is thiamine mononitrate, a form of thiamine that has the advantage of greater stability in certain food applications.

With the enrichment program, as well as general food fortification, steadily growing in stature, Merck continues to lead in every distinct, forward step.

Merck Vitamin Products for Enrichment and Fortification

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Thiamine Hydrochloride · Thiamine Mononitrate

RIBOFLAVIN (Vitamin B_2) **NIACIN** (Nicotinic Acid)

ASCORBIC ACID
(Vitamin C)

Merck Enrichment Ingredients for Millers, Bakers, Cereal and Macaroni Manufacturers · Merck Vitamin Mixtures for Flour Enrichment · Merck Bread-Enrichment Wafers · Merck Vitamin Mixtures for Corn-Products Enrichment · Merck Vitamin Mixtures and Wafers for Macaroni Enrichment.

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Questions & Answers

How Would *You* Do It?

Readers are invited to submit to FOOD ENGINEERING answers to questions in this department, especially to "This Month's Problem." Selected answers will be published, with credit (unless you specify otherwise). We pay space rates.

What Is *Your* Problem?

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 18, N. Y.

This Month's Problem

Question—Recently, we started to vacuum-pack roasted nuts in glass jars. But within a few months white deposits appeared inside the jars. Can you tell us what is responsible for this condition and how it can be avoided?

Answer to April Problem

The Question Was—How can we preserve pre-peeled potatoes which we are shipping in moisture-proof bags to the institutional trade?

Answer—Preservation of pre-peeled potatoes involves the prevention, until consumer usage, of the characteristic browning and subsequent blackening that occurs soon after the potatoes are peeled and exposed to the air. Attempts that have been made to curb this discoloration by dipping the peeled potatoes into various chemical solutions have met with varying degrees of success.

To date, the most effective treatments appear to be the use of SO_2 containing chemicals such as the metabisulfites. However, the effectiveness of even the sulfite treatment and, therefore, the expected storage life of the pre-peeled potatoes, is definitely contingent upon the temperature at which the potatoes are stored.

For example, most varieties will retain their normal color for at least three weeks if they are immersed for 5 sec. in a metabisufite solution containing 10,000 ppm. of SO_2 and stored at 40 deg. F. or below. However, the same potatoes would show noticeable discoloration in 3 days or less at 70 deg. F.

If longer dipping times are considered advisable, the concentration of SO_2 in the dipping solution can be reduced. An 8-min. dip in a metabisulfite solution containing 3,000 ppm. of SO_2 will prevent the peeled potatoes from discoloring for two weeks or more if they are stored at 40 deg. F. —*Edward E. Anderson, Assistant Research Professor, Dept. of Food Technology, University of Mass.*

Simple Test for Evaluating Eggs

Question—Are there any simple methods of testing egg products to determine how they will perform in prepared mixes?

Answer—Although there are many chemical and physical tests that can be made on egg products, none of them adequately correlate with the performance of these eggs in mixes. Actually, the performance of an egg product in a mix is the only true measure of the performance quality of the product.

Other tests, however, are generally helpful in determining the suitability of a dried egg product. Odor, color and flavor tests are of definite importance. In the case of albumen, the quality measures are moisture, granulation, reducing sugar, protein, pH, and, in some cases, whipping performance. Most of these measurements are desirable for yolks and whole eggs. Fat content and bacterial counts are additional measurements that are helpful in evaluating the quality and uniformity of egg products.

Polarizing-Microscope Query

Question—What is a polarizing microscope, and what advantage does it offer over the conventional microscope?

Answer—Construction and design of the polarizing microscope is similar to the ordinary biological microscope. Only difference is that it has two polarizing prisms, called "Nicols," one below and the other above the stage of the microscope. The one below is always in the light path, but it alone does not produce any visible change in the transmitted light. The upper prism can be withdrawn from the light path to cause the objects viewed to appear the same as when an ordinary microscope is used.

When the upper prism is inserted into the path of light, the object is said to be viewed between "crossed Nicols." In this position, no light is transmitted unless an object that has

SCRUBBING CORROSIVE GASES ?

Fig. 645

Are your scrubbing nozzles as efficient as you think they could be? Do they resist the corrosion or wear conditions satisfactorily — produce the breakup and distribution you would like?

Outline your spray problem for use—if your liquid can be sprayed with direct pressure at all—Monarch can furnish the nozzles.

NOZZLES FOR:

- OIL ATOMIZING
- HUMIDIFYING
- AIR WASHING
- DESUPERHEATING
- SPRAY PONDS
- MILK POWDERING
- ACID CHAMBERS
- CONCRETE CURING

Write for Catalogs 6-A and 6-C

MONARCH MFG. WKS., INC.
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PHILADELPHIA 34, PA.

ARTIST: HERBERT MATTER

A Lincoln

The prudent, penniless beginner in the world labors for wages awhile, saves a surplus with which to buy tools or land for himself, and at length hires another new beginner to help him. This is the just and generous and prosperous system which opens the way to all—gives hope to all, and consequent energy and progress and improvement of condition to all.

(Message to Congress, 1861)

GREAT IDEAS OF WESTERN MAN: one of a series **CONTAINER CORPORATION OF AMERICA**

FRENCH DRESSING BOTTLER SAVES $3,200
KETCHUP MFR. REPORTS 38% SAVING
COLD FIGURES
prove that hundreds of food processors have
CUT SEASONING COSTS 20%–40%
through the use of
MAGNA Spice CONCENTROLS*
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MEAT PACKER SAVES $80,000
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NO WISHFUL THINKING THIS! Readily substantiated figures *prove* that hundreds of food processors are slicing thousands of dollars off their seasoning costs *annually* through the use of concentrated, *natural* MAGNA Spice CONCENTROLS. These *facts* tell you why MAGNA CONCENTROLS *must* save you money!

FACT ▸ ***Because they are PURE, carrier-free seasoning all the way through, MAGNA CONCENTROLS must cost you less per batch!***

FACT ▸ ***Because they reduce bulk to a minimum, they must give you maximum economy in shipping, storing, handling.***

FACT ▸ ***Since you yourself add the basic spice oil to your product, you achieve complete in-plant control of seasoning uniformity.***

May we show you how you can obtain *all* these advantages without changing the flavor of your products? Let the MM&R Food Technology Dept. duplicate your present spice formulae *precisely*—with a guaranteed saving of 20%-40%! Inquire today... no obligation!

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T.M. REG. APPLIED FOR
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Orange Oil that Surpasses
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AMERICAN U.S.P.

with the Magna-fied true-orange flavor

Think you are using the best Orange Oil now? Then keep an open mind while you try MAGNA ORANGE OIL – the Orange Oil that gives you *maximum* uniformity, *maximum* solubility, *maximum* flavor trueness! Your first trial batch will prove to you what *thousands* of users have already discovered – that MAGNA ORANGE OIL is *surprisingly better!* Surprising, too, how *much* you save when you specify MAGNA ORANGE OIL. Write for complete information and schedule of prices.

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some effect on the light is placed in the field on the stage of the microscope. The background will appear black, while most crystalline objects will be bright.

Primarily a qualitative instrument, the polarizing microscope can be used to make close estimates of the percentages of various ingredients present in products like prepared mixes.

The polarizing microscope can serve as a quality-control tool. It can be used to: (1) Quickly identify ingredients for which methods of analysis are not readily available, (2) confirm presence or absence of ingredients for which analytical methods are available, (3) eliminate variations in appearance of products due to difference in manufacturing practices, or (4) analyze small samples.

Re Evaporator "End-Point"

Question—We concentrate tomato products in a single-stage vacuum evaporator. We have tried to establish "end-point" control by the boiling-point rise method. One bulb of a two-pen temperature recorder is placed in the product, and the other in water vapor boiling off. Theoretically, the rise in product temperature over vapor temperature should tell us how concentration is proceeding. But often the two recorder pens show hardly any difference and sometimes are even reversed. We have had our instrument carefully checked, and it is Okay. Have you any idea where our trouble lies?

Answer—Correct boiling-point rise technic involves a representative measurement of product temperature *during boiling* and a measurement of water vapor under the same vacuum. Usually, the product measurement is easy—a simple location of the temperature element in the center and well below the surface. But the product must be boiling and circulating.

The water vapor measurement, however, is the one usually giving the trouble. Many evaporators have heating surfaces—such as calendria coils or a steam jacket—exposed as the product evaporates. These superheat water vapor coming off the product, and its temperature will often actually exceed that of the product. Also, placement of the vapor temperature bulb too near the product surface sometimes results in measurement of entrained product.

It has been found that the safest way to get a true vapor bulb reading is to locate a small "pilot" pan in series with the main evaporating system. This unit will boil water, under the established vacuum, and give off a non-superheated, non-entrained vapor which can be measured with the second bulb. —*End*

Glistening Protection

AGAINST PRODUCT CONTAMINATION

AN examination of Tri-Clover sanitary fittings, valves, pumps and specialties will convince you that here is your finest protection against product contamination. The close grained, flawless surface and the exclusive Hi-Gloss finish of Tri-Clover products truly exemplifies the positive protection and cleanliness that is so necessary in processing foods and beverages.

Tri-Clover has spent over 30 years in developing the most complete line to satisfy every product demand and piping problem. Careful, precision fabrication methods have developed this superior line. Leak proof . . . easy to install . . . easy to disassemble and clean . . . long life . . . completely sanitary . . . exclusive designs . . . these are the features that benefit Tri-Clover users.

Satisfy all your fitting, valve, pump, tubing and piping requirements from this one dependable source. Specify Tri-Clover throughout your plant, and assure yourself of the finest. See your nearest jobber or write us for information.

No. 7 SANITARY TEE
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No. 21 ADAPTER — MALE NPT and SANITARY THREAD
No. 60Q TWO-WAY ECCENTRIC VALVE—Designed especially for bottler's use.
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No. 60T "T"-TYPE COMPRESSION VALVE
SPECIAL "SUPER SPEED" BOTTLER'S TOOL SET . . . contains all tools necessary to completely install and service 1-inch sanitary lines, in handy case.
TRI-CLOVER CENTRIFUGAL PUMPS . . . a complete line of non-clogging Sanitary and Industrial types for dairy and food processing — bottling — chemical and general industrial use.

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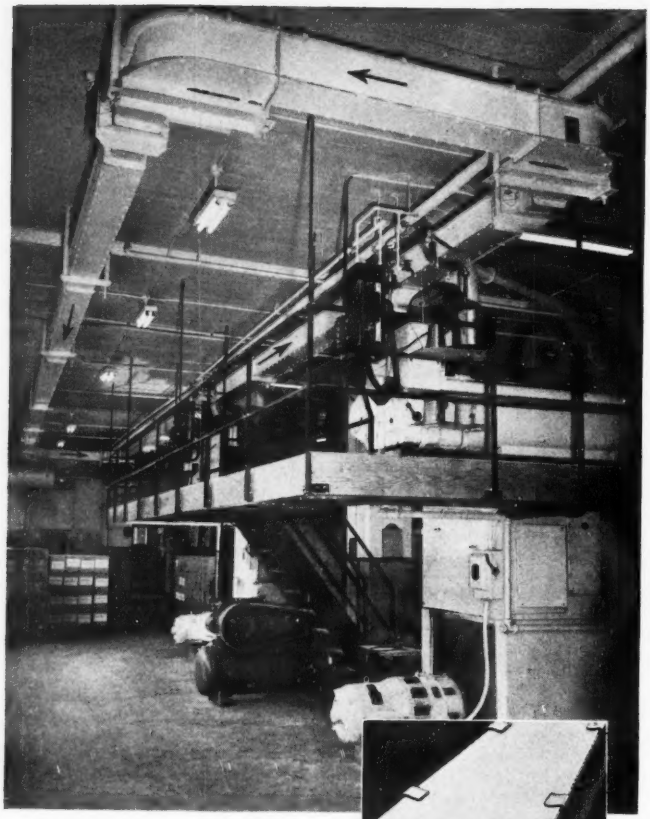
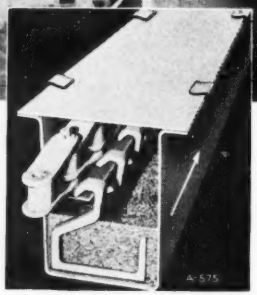
FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

"Our Thirtieth Year"

"Keep It Clean and Keep It Moving"...

Was the Handling Requirement in this Food Plant





C. F. MUELLER CO.
Jersey City, N. J.

The REDLER Closed-Circuit Conveyor is mounted under the ceiling. By chute from the floor above, it receives semolina flour and farina used in making spaghetti and macaroni. Materials are conveyed around to and discharged into automatic weigh scales above the presses (right center). Arrows indicate direction of flow. If the scales are full, discharge gates are closed and materials may be re-circulated in the conveyor until the scales are ready to receive. This is a feature not available on any other type of conveyor. Inset shows cross-section of fully enclosed, dust-tight casing and details of side-pull chain and skeleton flights that constitute the conveying element.

Carrying semolina and farina without fuss or muss, in continuous flow to automatic weigh scales is the task of this REDLER Closed Circuit Conveyor. An unusual part of the job is this: if the scales are full, the materials can re-circulate in the conveyor until the scales are ready to receive. The whole operation must be constant. S-A engineers recommended, designed and installed a space-saving REDLER Conveyer that is meeting all requirements and insuring contamination-free ingredients.

Solving bulk materials handling problems for greatest economy and efficiency has been the achievement of S-A engineers for 50 years. They have a background of specialized know-how that can be invaluable in applying the *right* answer to your bulk handling needs. And they can draw upon a line that includes *every* type of bulk handling equipment.

Write for a free survey by an S-A engineer. No cost or obligation to you.

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50 years experience with bulk handling

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Useful New Books & Government Publications

Food Processing Aspects of Industry Dominate New Book on Fisheries

MARINE PRODUCTS OF COMMERCE, 2ND EDITION. *By Donald K. Tressler and James McW. Lemon. Published by Reinhold Publishing Co., 330 W. 42nd St., New York 18, N. Y.,* 1951. 782 *pages; 6¼x9¼ in.; cloth. Price,* $18.

Completely new branches of the fishery industry have sprung up since the first edition of this book was published 27 yr. ago. Consequently this second edition bears little resemblance to the first. In fact, only two of the chapters, those on Sponges and Fish Glues, remain substantially unchanged, according to the authors.

Foremost among the developments since 1923 are the preparation, packaging, quick freezing, transportation and marketing of fish fillets and fish steaks. These operations are described in detail, as are practically all the other methods of processing, preserving and distributing fish and shellfish.

While the food aspects of the whole fishing industry dominate the book, the authors also consider such related matter as vitamin, amino acid and other nutritive values of fish and fish oils, fish meal in animal feeding, and seaweed as fertilizer.

In addition there is an attempted statistical survey of the world's fisheries and their products, and there are comprehensive studies of the many uses of fish products and byproducts in the world's industries.

Fourteen experts, writing in their special fields, have collaborated with Dr. Tressler and Mr. Lemon in producing this all-inclusive treatise. Well known for his work in food technology, Dr. Tressler is at present scientific director, Quartermaster Food & Container Institute for the Armed Forces. Mr. Lemon is a technologist with Fish & Wildlife Service, Dept. of Interior.

Dairy Processing

MILK AND MILK PRODUCTS, 4TH EDITION. *By Clarence Henry Eckles, Willes Barned Combs, and Harold Macy. Published by McGraw-Hill Publishing Co., 330 W. 42nd St., New York 18, N. Y.,* 1951. 454 *pages; 6¼ x 9¼ in.; cloth. Price* $5.

Dairy developments in the middle and late 1940's were deemed important enough to justify a major revision of this standard text. It offers up-to-date information on the chemistry and biology of milk, on common dairy processing, on the manufacture of dairy products, and on dairy testing and calculations.

Text also includes a discussion of the microbiology of milk, recognizing the importance of the relationship of microorganisms to changes in the composition and properties of milk and milk products.

Bread Baking Primer

THE PRACTICE AND SCIENCE OF BREAD MAKING, 2ND EDITION. *By D. W. Kent-Jones and John Price. Published by The Northern Publishing Co., Ltd., Liverpool, England,* 1951. 278 *pages; 5¾x 8¾ in.; cloth. Price* 25s.

Here is another completely rewritten second edition that followed its predecessor after a long lapse. And the advances in bread baking since 1934 amply justify this new volume.

The book is first of all a primer on the art and science of bread baking in England. It tells the baker not only what to do, but why, and what happens if he fails to do it correctly.

While cereal chemists are likely to consider the book rudimentary, they may find it to be a convenient reference for their non-technical associates. And quite likely the bakery engineer will be compensated for the little time it will take him to carefully peruse the book's contents.

How to Process in German

LEBENSMITTELTECHNOLOGIE. *By Rudolf Heiss. Published by J. F. Bergmann, Springer-Verlag, Reichpietschufer 20, Berlin W 35, Germany.* 1950. 344 *pages; 7x10 in.; paper. Price 27.60 D. M. (Cloth Cover 29.60 D. M.).*

If your German is adequate, you will find this a concise and dependable account of European methods in food processing.

Covering processing, preserving and utilization from both the general and particular aspects, the book first discusses such principles as the role and character of colloids, filtration, crush-

A thin coating of Fuller Floor Wax protects *and* beautifies your floors. Cleaning problems are simplified, too, since the dirt is all on top of the wax film. This means *less cleaner, less elbow grease, less time* required.

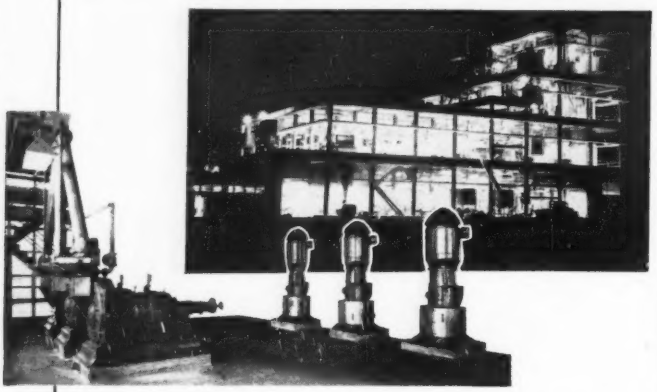
Your Fuller industrial representative can recommend the type — liquid or paste — best suited for your requirements. Ask him, too, about Fuller Furniture Polish and Fuller Metal Polish to protect and improve the appearance of your furniture and equipment, or write . . .

3640 MAIN STREET, HARTFORD 2, CONN.
In Canada: Fuller Brush Co., Ltd., Hamilton, Ont.

New CORN PRODUCTS PLANT MODERNIZES STARCH and SUGAR PRODUCTION

The "Bluebonnet" plant at Corpus Christi, Tex., *made headlines*—not only because of its unique wall-less construction. Of even greater interest to the process industry are the much improved, continuous methods used to transform Milo Maize into starch and sugar. The engineers of Corn Products Refining Company broke with tradition—sought and found a *better way* to make starch!

Here, the old conventional stone-type buhr mill was replaced with modern-day *degerminating mills, disintegrators,* and *repulpers* . . . all specially equipped for starch processing.



At Corpus Christi, six Sprout-Waldron 36" single disc degerminating mills handle the full plant load of incoming grain, freeing the germ from the kernel without crushing it. After separation, three disintegrators and two SW 36" double disc repulpers take over and together do a job that formerly required six buhr mills, moisture expellers, and a three-stage coarse fiber washing station to get the same results.

Engineers of the "Bluebonnet" plant point out that the use of Sprout-Waldron repulpers, in combination with disintegrators, improves the recovery of starch, decreases maintenance costs, and requires considerably less floor space than previous methods.

Why not bring your size reduction problems to Sprout-Waldron? Our broad experience may be helpful to you, too! Write Sprout, Waldron & Co., Inc., 35 Waldron St., Muncy, Pa.

LOOK TO SPROUT-WALDRON for BETTER PROCESSING EQUIPMENT

Sprout-Waldron

Manufacturing Engineers

SINCE 1866

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ing and comminuting, processing, drying, milling, size grading, centrifuging, atmospheric and vacuum evaporation, crystallizing, conveying, and container filling.

Particular foods and operations considered include: Margarine, potato and other starches, milk products, pectin, gelatine, essential oils, sugar, jellies, jams and marmalades, animal fats, corn syrup and corn sugar, yeast extract, compressed yeast, sauerkraut, beer and wine.

But let's be clear on one point: This is not a translation. The only non-German passage in the whole book is the copyright.

Operating Design

PLANT LAYOUT. *By Randolph W. Mallick and Armand T. Gaudreau. Published by John Wiley & Sons, Inc.,* 440 *Fourth Ave., New York* 16, *N. Y.,* 1951. 391 *pages;* 6¼x10¾ *in.; cloth. Price,* $7.50.

New machinery and other forms of new equipment are constantly reducing direct operation costs in our industrial plants. Frequently, however, service costs are increased because of layout deficiencies.

Accordingly, planning rearrangement for existing plants and designing layouts for new plants constitute the engineering functions expounded here.

In view of the subject's importance, particularly to the process industries, this book should be very welcome to the food engineer. While not confined to any one industry, the authors center their attention on layout problems encountered in scores of manufacturing plants throughout the country over the past 25 years.

Government Publications

HARVESTING, HANDLING, AND TRANSPORTATION OF CITRUS FRUITS. *By D. H. Rose, et al. Department of Agriculture, Bibliographical Bulletin No.* 13. *Price* 40c. A digest of information published from 1938 to 1948. Includes technical material arranged by subject matter and a bibliography.

SOME PLANT RESPONSES TO CERTAIN INSECTICIDES IN THE SOIL. *By Arthur C. Foster. Department of Agriculture, Circular No.* 862. *Price* 15c. Summarizes effect of insecticides in the soil on subsequent crops.

INTERLOCKING DIRECTORATES. *Unnumbered Report of Federal Trade Commission. Price* $1.25. Summarizes organization and activities of major

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New, untrained, or day-dreaming personnel can cost you customers and money — by letting uncooked food slip by.

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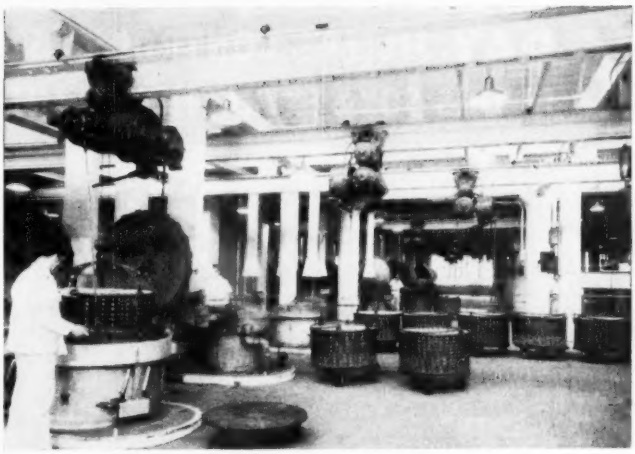

How to keep a hoist from growing old before its time!

The time to add years to the life of your hoist is *before you buy it!*

You can do this and avoid costly production slow-downs later if, before you buy, you estimate what the maximum and average loads are to be; how frequently your hoist will be called upon to handle those loads within a given period.

You will also want the answers to these questions: What distance is the load to be lifted and lowered, and at what speeds? How quickly must the hoist travel from one location to another to keep production at top efficiency? What temperatures are likely to prevail? Are there any corrosive influences? . . . and many others.

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companies in most important divisions of manufacture, including all of major food processing industries.

FRUIT THINNING WITH CHEMICAL SPRAYS. *By L. P. Batjer. Department of Agriculture, Circular No. 867. Price* 20c. A guide to recommended practice, including a summary of experimental results of government and non-government investigators.

COMPARISON OF THE 2, 6-DICHLOROPHENOLINDOPHENOL AND 2, 4-DINITROPHENYLHYDRAZINE METHODS WITH THE CRAMPTON BIOASSAY FOR DETERMINING VITAMIN C VALUES IN FOODS. *By Elizabeth M. Hewston, et al. U. S. Department of Agriculture, Technical Bulletin* 1023.

These recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated, the pamphlet is free and should be ordered directly from the Bureau responsible for its issue.

ANIMAL AND VEGETABLE FATS AND OILS 1945-1949. *Bureau of the Census, Facts for Industry Series: M17-1-09. Mimeographed.*

MILK PRODUCTION ON FARMS AND STATISTICS OF DAIRY PLANT PRODUCTS, 1950. *U. S. Department of Agriculture. Unnumbered document. Mimeographed.* A collection of statistical information summarized in preliminary form.

DEHYDRATED MASHED POTATOES—A REVIEW. *By R. L. Olson and W. B. Harrington. Western Regional Research Laboratory, Albany* 6, *Calif. Mimeographed.* Covers patents and other available literature up to Sept. 1950.

BUTTER PRICING BY IOWA CREAMERIES. *U. S. Department of Agriculture. Circular C-136.* This publication reports the results of a study by the Cooperative Research & Service Division of the Farm Credit Administration, in cooperation with the Iowa Agricultural Experiment Station. The study was financed under the Research & Marketing Act.

CLEAN WATER IS EVERYBODY'S BUSINESS. *Federal Security Agency. Public Health Service Publication No. 11. Price 20c.* Included here is an outline of the problems and objectives in preventing and abating stream pollution. The programs of federal, state, and regional groups are indicated.

—End

6 DAY FILTERS CONTROL DUST IN THIS SOYA EXTRACTION PLANT

The 250-ton-per-day Soybean Extraction Plant of The Glidden Company, located at Indianapolis. The products produced here are degummed and non-degummed soybean oil and 4-Hi Meal.

The Glidden Company has assumed a leading role in the nation's food, paint and chemical industries and today operates 37 plants and two mines in 25 communities. Visualizing the soybean as a vastly important source of raw materials for food, feed, paint and chemicals, Glidden established soybean research and processing plants at Chicago and Indianapolis.

Important in soybean processing is the elimination of the dust problem. For this purpose Glidden chose **DAY** Dust Control systems with highly efficient **DAY** Type "AC" Dust Filters.

6 FILTERS, 4 COMPLETE SYSTEMS INSTALLED IN INDIANAPOLIS PLANT

System one includes one **DAY** Type "AC" Dust Filter installed on the pulverizer grinding system used for grinding toasted flakes into meal.

System two combines two **DAY** Type "AC" Dust Filters operated in parallel for dust control on the bean preparation operations, including de-hulling and the collecting of dust off the flakes before they are transmitted to extraction.

System three consists of the extraction filters. Two **DAY** Type "AC" Dust Filters are connected in parallel and recover dust from the hull cyclone and the meal cooler cyclone.

System four utilizes one large **DAY** Type "AC" Dust Filter which is divided into two sections and located on the track shed roof. Section one collects dust from the bulk meal car loading system; section two collects dust from the grain unloading operations at the elevator.

DAY CAN SOLVE YOUR DUST PROBLEM

Since 1881, The **DAY** Company has specialized in engineering, manufacturing and installing dust control systems. **DAY** engineers are ready to serve you efficiently and economically regardless of the dust situation in your plant.

For complete information about **DAY** Dust Control Systems and the **DAY** Type "AC" Dust Filter, Write-to-**DAY**.

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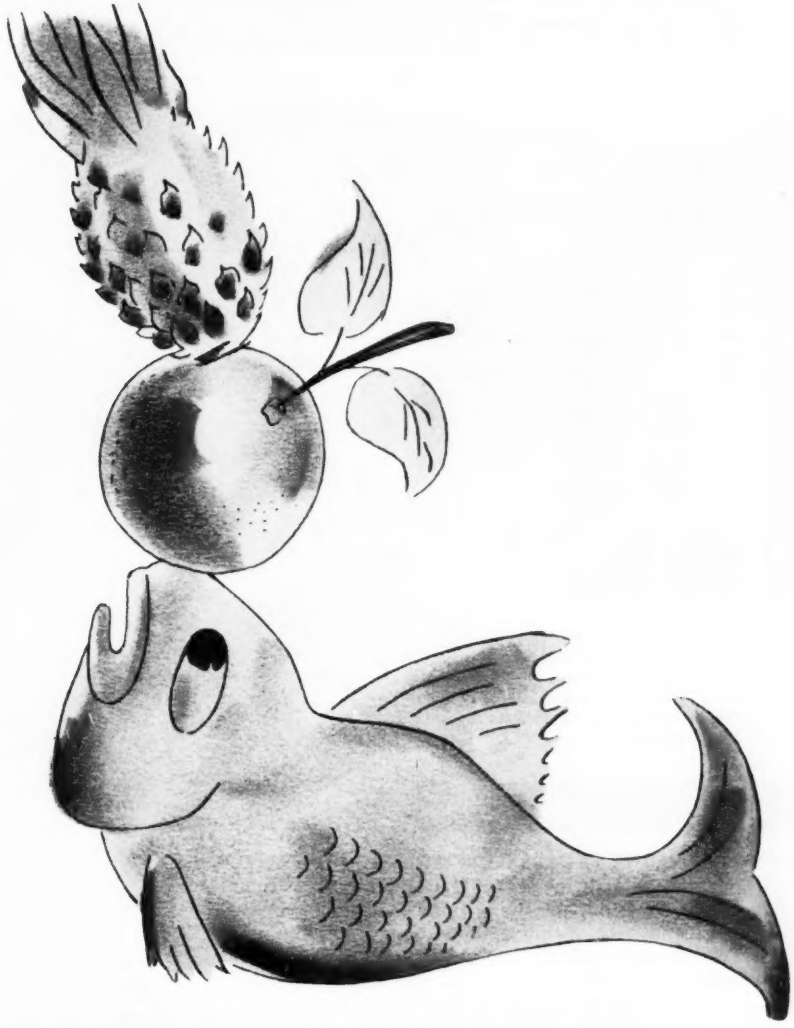

Preserving foods . . . from fruit to fish

Whether your product is fruit, fish or any of scores of other foods, you can depend upon Monsanto Sodium Benzoate as your preservative. It protects many products and keeps them appealing to create customer satisfaction and bring repeat business.

Monsanto Sodium Benzoate, the sodium salt of benzoic acid, is among the purest chemicals produced in commercial quantities. It assays 99.0% pure. Like other Monsanto Chemicals for food use, sodium benzoate is manufactured under strict laboratory control.

Monsanto makes sodium benzoate in flake and powder forms, both of which are equal in uniform purity. Many users prefer flakes because they do not cake or ball and are practically free of dust. Both forms dissolve rapidly.

If you require a preservative in your business, you will find Monsanto's 16-page booklet, "*Benzoic Acid and the Benzoates,*" interesting and helpful. For your free copy, contact the nearest Monsanto Sales Office or write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

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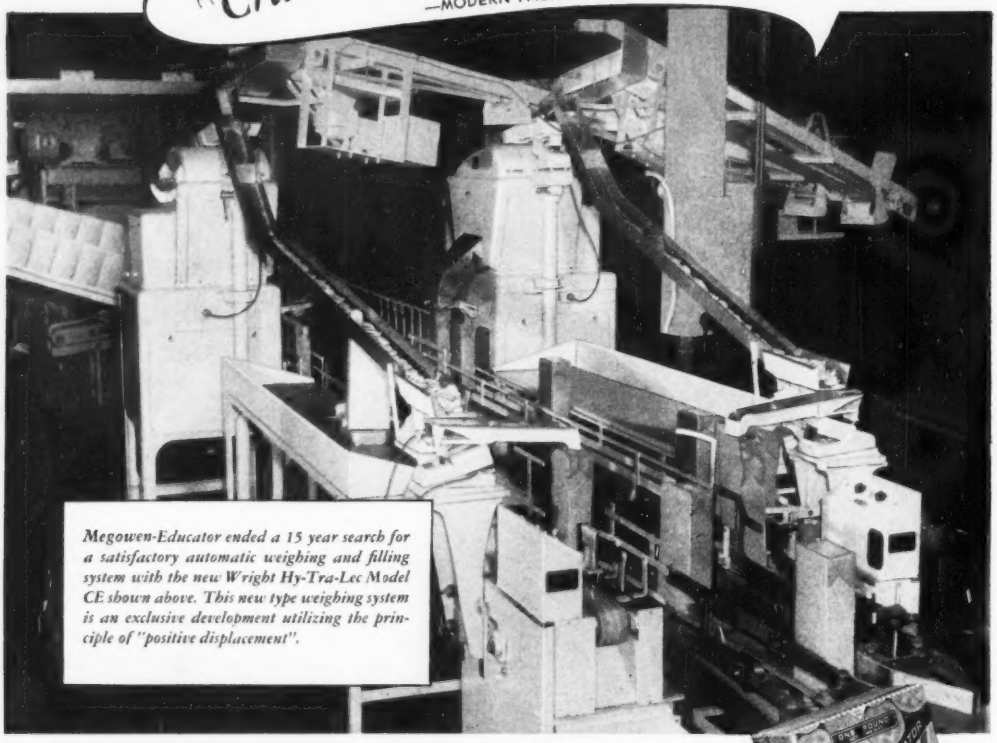
—MODERN PACKAGING, APRIL, 1951



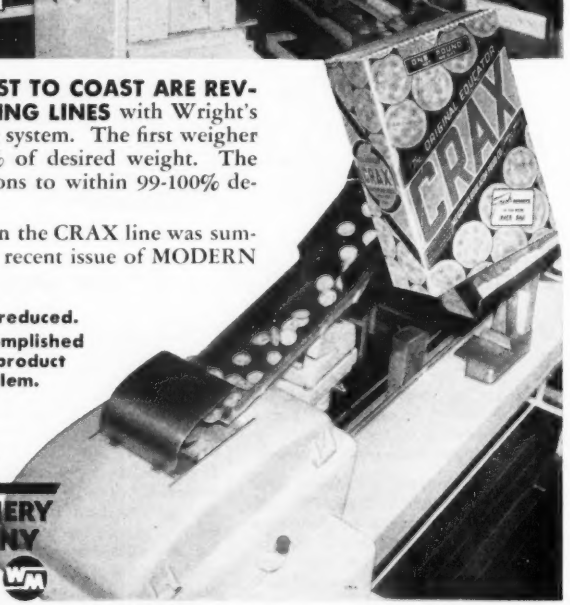
Megowen-Educator ended a 15 year search for a satisfactory automatic weighing and filling system with the new Wright Hy-Tra-Lec Model CE shown above. This new type weighing system is an exclusive development utilizing the principle of "positive displacement".

LEADING BAKERIES FROM COAST TO COAST ARE REVOLUTIONIZING THEIR PACKAGING LINES with Wright's Hy-Tra-Lec CE weighing and filling system. The first weigher pre-fills the cartons to within 98% of desired weight. The second weigher finish fills the cartons to within 99-100% desired weight.

How this equipment operates on the CRAX line was summarized by Megowen-Educator in a recent issue of MODERN PACKAGING as follows:

(1) Labor costs are noticeably reduced.
(2) The filling operation is accomplished with a gentle handling of the product so that breakage is not a problem.
(3) Reliability of the weighing devices is most satisfactory.

WRITE TODAY FOR LATEST LITERATURE.



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KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

Can Closing Scramble

The trouble the Office of Price Stabilization is having in trying to run price control programs for all industry was indicated in a recent action setting up special regulations to cover can-closing machines.

In order to resolve a conflict between its regulations and Federal antitrust judgments, OPS had to permit two can-making firms to increase prices to compensatory levels. The two companies had been leasing closing machines and related equipment at nominal rentals well below the cost of doing business, as an inducement for lessees to purchase cans from them rather than from their competitors.

The court required both companies to raise their rental rates, thus making their operations competitive with other companies in the same business. Therefore, OPS had to write a special order to conform with the court's judgment.

The court also ordered that the can companies must sell their closing machines to those processors who choose outright purchase in preference to use on a lease basis.

Hot Weather Chocolate

Temperature resistant "cocoa type" coating for candies in climates where temperatures reach 100 deg. F. is described in the April *Activities Report* of the Associates, Food & Container Institute.

Usual "cocoa type" coating is composed of cocoa powder, dry milk solids, sugar and high melting point (110-112 F.) vegetable fats. To this coating was added 1 percent of an equal mixture of sorbitan monostearate and polyoxyethylene sorbitan monostearate. Wrapped candy bars covered with the resulting coating showed no tendency to stick to the wrapper, and the coating remained "fairly firm."

"Apparently," says the report, "these monostearates not only act as emulsifiers but also have some effect on the physical characteristics of coatings." In addition the monostearate coatings left none of the waxy taste that generally remains after eating the usual coatings made with higher melting fats.

Another mixture of these same monostearates (Tween 60 and Span 60) are effective in retarding chocolate-bloom, according to a report made at the Pennsylvania Manufacturing Confectioners' conference at Lehigh University. Factory scale tests on this development are underway in a Philadelphia plant.

Holds On to Moisture

Sorbitol will keep candy soft and moist over a wide range of humid conditions, Justin J. Alikonis, chief chemist, Paul F. Beich Co., told a recent conference of the Pennsylvania Manufacturing Confectioners Assn., at Lehigh University.

Tests made of fudge samples containing approximately 15 percent sorbitol resulted in extended shelf life, he said, and therefore, suggested replacing 10 to 15 percent of corn syrup, invert sugar or sugar, called for in your best fudge recipe, with sorbitol for best results.

Sorbitol, the Beich lab found, may be used in any confection where moisture retention is desired. It works on coconut, creams, and grained nougats, with the percentage to be used left to the candy maker.

Bake Mixes Must Fit

Prepared bake mixes are developed for use in the home, so directions should be in terms of standard "home size" units. Moreover, George Garnatz, of Kroger Foundation, told a recent gathering of prepared mix producers, the pans and utensils used in laboratories should also be confined to standard home sizes.

Kroger surveys have determined, he said, that the homemaker's impression of a product is almost as dependent on how well you get across to her the technic of handling and putting the material together as it is on what is put into the package. The product stands to make an unfavorable impression if its specifications are geared to an 8-in. pan, when the nearest size likely in the home is 10 in.

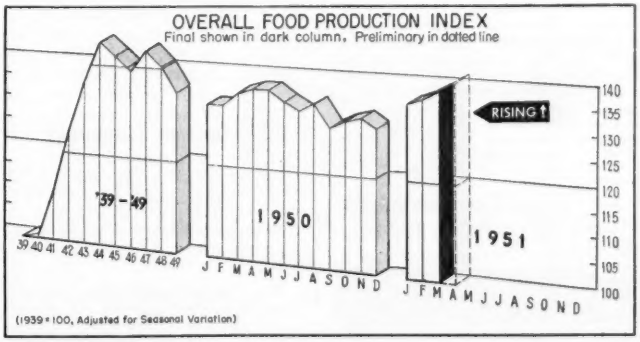
Judging from Mr. Garnatz's figures on the growth of prepared mix sales, however, present laboratory specifications must be largely satisfactory. Using 1946 as 100 percent, he cited this growth pattern: 1943, 31.6 percent; 1944, 111.8; 1945, 93.2; 1947, 146.2; 1948, 653.2; 1949, 748.2; and 1950, 748.2. The last two figures, he suggested, might indicate that the easy growth period is over and that future progress probably will depend upon effective development and promotion.

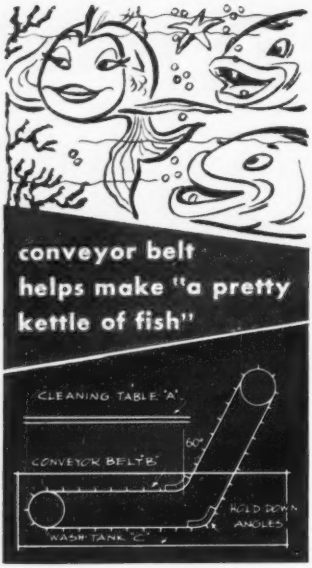
Bow to Unacceptability

The Quartermaster Corps has discovered an important basic fact that food processors could have pointed out long ago: Unless the consumer likes the product there isn't much use producing it. A semi-official statement of the Quartermaster says:

"While dehydrated foods having the same nutritional value as fresh foods are available, they are not served in troop mess halls because of their low acceptability. It has been determined that unacceptable foods, regardless of how cheaply they can be produced, are costly in the long run. The Quartermaster Corps has found that there is little use in perfecting dehydrated foods of this type when the average soldier does not care for them served freshly cooked."

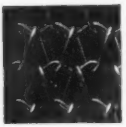
Why else would chewing gum production be still climbing while chewing tobacco is on the rocks?





No pun intended! This Cambridge woven wire conveyor belt carries cleaned fish through a wash tank to remove scales and scrap so the fish will present an attractive appearance on retail counters.

Cleaned fish are dropped from cleaning table A, onto the surface of conveyor belt B, passing through wash tank C. At the end of the tank hold-down angles change the movement of the belt to a 60° incline. Stainless steel wire, used in weaving this belt, resists corrosive attack of salt water in the wash tank, can be cleaned without damage by steam or by detergents added to the salt water.



In this application, **BALANCED BELTING** provides low original cost and controllable belt travel. ½" openings in belt weave permit free drainage of wash water and scraps. Angle cleats across the belt hold the fish during the upward movement.

Whatever food you're processing, there's no need to fish around when you want experienced advice on any problem of combining movement with processing. Call in your Cambridge field engineer for his recommendation on the proper . . .

CAMBRIDGE WOVEN WIRE CONVEYOR BELTS—any metal or alloy, mesh or weave. Write direct, or see "Belting-Mechanical" in your Classified Telephone Directory.

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OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Holland Baked Goods

Here are some of the packaged baked goods the Netherlands plans to place in U. S. markets after they are displayed at this summer's international food exposition in Chicago. Canned bread and packaged biscuits and cookies make up the bulk of the exhibit, although that tall bottle indicates they won't force domestic beverages on us if they can help it. (Wide World)

Wrong Freezing Time

Texas citrus output next year will be under 1,000,000 boxes, according to recent estimates of damage caused by the late winter freeze in the state's growing areas. With the processors thus pinched for raw material there is some talk of encouraging the importation of Mexican citrus. It is noted, however, that the latter was hit about as hard as the Texas output.

Meanwhile, Florida citrus growers are experiencing another boom with prices climbing and supplies ample. However, the state's juice concentrators are retracting their earlier predictions of 30 to 40,000,000 gal. total production. The brightest guess recently was 25,000,000 gal.

Incidentally, Florida processors are claiming 1.25 gal. of juice per box, this year, as against 1.08 gal. in 1950.

Seek Heavier Carloads

Since shortage of freight cars demands heavier loading, food operators are urged by USDA to avoid spoilage and subsequent waste of raw materials caused by delays in transportation.

Best known waste-saving practices are to be investigated with top priority for research if USDA follows recommendations of its Transportation Advisory Committee. Food operators are urged to make appropriations from Department funds to study ways in which heavier loading can be accomplished without increasing product damage.

Especially needed are means for cushioning heavier loads, and ways of getting lower freight rates per ton of product when full car loading is assured. It is believed that such a dollars-and-cents incentive may greatly increase the efforts of both raw and processed food shippers.

D.D.T.-Flavored Beef

Discussion of the effects of D.D.T. on dairy and meat products took over a major portion of the Delaney committee hearings on chemicals in foods during early May.

Probably the most startling testimony came from John Dendy, Texas Research Foundation. He testified that all milk and meat samples bought at regular retail outlets near Dallas were contaminated with D.D.T., degree ranging from 3.10 ppm. in lean meat to 68.55 ppm. in fat meat. In milk, contamination ranged from 0.5 ppm. to 13.83.

Spraying of feeding areas with D.D.T. and other chlorinated hydrocarbons was found to be the cause.

The dairy cow or beef animal feeding on D.D.T.-sprayed corn absorbs a portion in its fat and passes the insecticide on to human beings.

Further evidence on the toxicity of D.D.T. was presented by several witnesses, but no conclusions were reached.

Canners Aren't Cutting

Although sporadic reports tell of some "planned" production rather than an all-out canning effort, a check among canners reveals no specific cases. The alleged cautiousness appears to be as nebulous as the names of the firms doing this "planning."

All evidence points to a greater pack this year than last. This despite the fact that there is some indecision because of what the Office of Price Stabilization may or may not do.

(*Turn page*)

Hors d'Oeuvres

• *We well know that sponsors of the "More Meat and How to Get It With a Common Sense Meat Program" are thinking only of the kind of meat having time honored acceptance in the American market. But horsemeat industry could misunderstand a recent release of theirs which begins, "Ample meat at stable prices. . ."*

• Strike hit the W. K. Kellogg cereal plant last month over disputes on pensions, insurance, length of paid vacations—and demand for a holiday on W. K. Kellogg's birthday. None of that letting down the founder at Kellogg.

• *A professor in Connecticut told a group of New Englanders that no single food product is absolutely essential in either war or peacetime. No use arguing about it. For all we know they might not consider salt a food in Connecticut.*

• Golden State Dairies tells of an educational program for the controlled breeding of California dairy cattle. But nowhere does it come right out and say who is being educated.

• *And on top of Golden State's news comes the information from Ohio State's school of agriculture that cows are sensitive creatures constantly churned by emotional conflicts. Getting so not even people know what to think.*

• Dresses made from corn formed one of the exhibits at the 16th annual conference of the National Farm Chemurgic Council. It might not be too soon to set aside a couple of cans of the eatin' stuff to show your grandchildren how it was used in the old days. **J. A. J. J.**

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Every Kind

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Plates, Structurals, Bars, Sheets, Tubes, etc. . . . Carbon, Alloy and Stainless Steels . . . .

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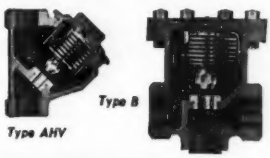
Large Processor Achieves

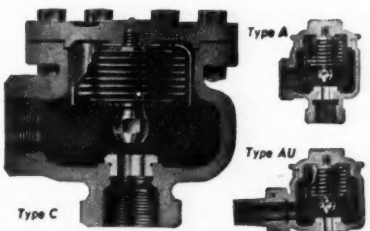
MORE UNIFORM HEATING CYCLES

With Nicholson Steam Traps

The positive action of Nicholson traps was recently used successfully by a chemical maker to smooth out the heating cycles of cookers at 50 to 60 minutes, against previous periods up to 105 minutes. Steam flow was upped to 3000 lbs. an hour against 2000 for the previous mechanical type.



5 TYPES FOR EVERY APPLICATION, process, heat, power. Sizes ¼" to 2"; pressures to 225 lbs. To learn why an increasing number of leading plants are standardizing on Nicholson thermostatic traps . . .



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W. H. NICHOLSON & CO., 193 Oregon St., Wilkes-Barre, Pa.

Keep up to date

ON NITROGEN IN THE FOOD INDUSTRIES

through LINDE

Day by day, more food processors and packers are turning to high-purity nitrogen to prevent deterioration of their products from oxidation. The improved storage quality of nitrogen-protected foods results in a wider margin of profit through less spoilage.

High-purity LINDE Nitrogen may help improve your product or simplify your process. Some of these LINDE reports may suggest ways to you:

★ "Gasometry—For Sharper Control of Food Quality" *Product shelf life improved through control of contained gases.*

★ "Investigations on the Use of Nitrogen for the Preservation of Perishable Food Products". *The "how" and "why" of food oxidation deterioration prevention.*

★ "Where Trim the Oxygen Content". *Methods for determining where and how to decrease harmful oxygen content of liquid foods.*

★ "Juice Color is Bettered by a Gas Blanket". *Nitrogen blanketing of fruit pulping operations. Applicable to vegetable products.*

★ "Relationship of Headspace and Dissolved Oxygen in Liquid Food Containers". *Sample calculations and nomographs for determining effective oxygen exclusion.*

★ "Nitrogen Protection of Edible Oils". *How to maintain peak oil quality from refinery to consumer.*

★ "Wrapper Test Promises More Shelf Life". *Simplifies choice of oxygen-excluding film for effective gas packing.*

★ "How Nitrogen Protects the Quality of Foods". *How various processors protect their products against oxidation deterioration.*

★ "Liquid Nitrogen Pulverization". *Continuous pulverization of food products, spices, without loss of volatiles, changes in flavor.*

★ "Practical Factors in Nitrogen Packing Using Flexible Film". *Machine, film, and packing requirements for prevention of food spoilage.*

Check the reports you want, tear out this advertisement, pin it to your letterhead and mail it to LINDE in New York or to the LINDE office nearest you.

LINDE Nitrogen 99.99% pure is supplied as a gas in steel cylinders, and as a liquid in tank-car and tank-truck lots. The liquid can be used for lightning-fast cooling (—320°F.), or can be converted to gaseous nitrogen as needed at the user's plant.

The term LINDE is a registered trade-mark of Union Carbide and Carbon Corporation.

LINDE AIR PRODUCTS COMPANY
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30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

Receives Babcock Award

Samuel Cate Prescott has been chosen to receive the 1951 Stephen M. Babcock Award of the Institute of Food Technologists. The award, which includes a $1,000 cash prize contributed by the Nutrition Foundation, is made annually for distinctive contributions to food technology.

Dr. Prescott's achievements cover the past 50 years, beginning with his work on the relation between spoilage of canned foods and the growth of microorganisms. His later work includes notable contributions to milk sanitation, coffee chemistry and food dehydration.

The fact that the military services have given the canners fairly reliable estimates of their requirements is not in itself a good enough reason for canning "close to the chest," say the canners. No one can predict the civilian demand accurately. And in these next few months of rapidly changing prices, due to government interference with the price structure, anything can happen.

There is no evidence of an acreage cut in planting. On the contrary, as the National Canners Assn. points out, there is evidence that more has been or will be planted for canning than last year. The association's statement is reinforced by official USDA estimates based on their survey of "intentions to plant."

It is true that canners are taking into consideration sharply higher products costs and the lack of knowledge of what OPS will do. Raw products, labor and packaging are all higher than last year. But how much any of these factors will figure in the decision whether to go "all out" or "tailor" production, depends on individual canners. The canners association does not see any evidence industry-wide that there is any large-scale cut in prospect.

There is some evidence that increases in supplies of asparagus, the first

item on the way to canneries, has caused some planters to go slow. But tomato planting for canning is considerably over last year.

Canners have already made up their minds on their packs, but it is too early to give estimates on acreages where some packs may possibly be less than last year.

One thing is certain: There will be a bad squeeze for those who have gone ahead, but who do not now get an increase from OPS to compensate for increased production costs. The possibilities of what may happen to prices under government control is raising some fear that if increases are not granted some canners will not realize even their production costs.

Better Egg Treatment

Thermostabilization maintains quality of shell eggs, and pasteurization of liquid eggs reduces Salmonella, USDA researchers told a House subcommittee recently.

Heating shell eggs in oil for 16 min. at 130 deg. F., USDA said, resulted in a 55 percent Grade A yield after eight months in cold storage. This

Century of Progress

Ice cream, perhaps America's most unique contribution to the list of processed foods, observes its 100th anniversary this year. It was in 1851 that Jacob Fussell opened the world's first ice cream plant in Baltimore.

In early days, the hand cranked freezer turned in a low production schedule at high unit cost. But with introduction of steam powered equipment in the 1870's, mass production technics were adopted, and by 1900 manufacturers were turning out 25,000,000 gal. of ice cream per year.

When mechanical refrigeration replaced the brine freezer soon after the turn of the century, many additional production, handling and storage problems were eliminated. With these technical advances, production reached 148,000,000 gal. in 1910.

Invention of the continuous process freezer and developments in the freezing of fresh fruit and in prepackaging have brought production to almost 550,000,000 gal. a year.

Besides turning out one of our most nutritious foods, the industry provides a substantial market for fruit and nuts processors, packaging companies, equipment manufacturers, and producers of dairy and egg products.

A bill has been introduced in the Senate designating June 15 as National Ice Cream Day. It couldn't happen to a more deserving product.

(based on an actual case study)

"Five years ago we decided to eliminate the 'hidden costs' of production at our plant. We spent months on an exhaustive study of material-handling systems and equipment, and we depended heavily on the experience reports of other users.

"All our findings pointed to powered industrial trucks as the best solution, and we installed a complete truck-and-pallet system to cure our material-handling ills. (It was almost like getting a doctor's prescription!) This is how it worked out over the former manual methods used:

1. "LOADING AND UNLOADING PROBLEMS—unloading time cut 75% with a truck-and-pallet system.

2. "STORAGE PROBLEMS—by stacking to the roof, our fork trucks saved floor space . . . we cancelled leases on two storage buildings outside the plant.

3. "SAFETY PROBLEMS—easier work for employes; accident rate down; trucks are easy-to-handle.

4. "INVENTORY PROBLEMS—we save time by counting palletized units rather than individual items . . . an important saving in time here.

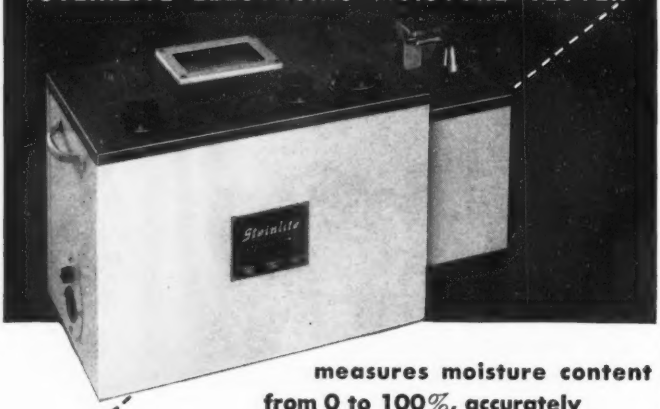
5. "OPERATION COST PROBLEMS—decreased cost of operation anywhere from 25% to 90% by mechanized handling."

THIS IS NOT AN ISOLATED CASE. Similar problems have been solved in all types of industries. Ask your industrial truck salesman for information about case histories in *your* industry. He'll be glad to show you how powered industrial trucks can help solve *your* material-handling problems.

THE INDUSTRIAL TRUCK ASSOCIATION
3701 NORTH BROAD STREET · PHILADELPHIA 40, PA.

NEW! REVOLUTIONARY!

STEINLITE ELECTRONIC MOISTURE TESTER



measures moisture content from 0 to 100%, accurately quickly, economically!

- ***Insures Quality***
- ***Eliminates Costly Guesswork***
- ***Provides Laboratory Equipment at Reasonable Price***

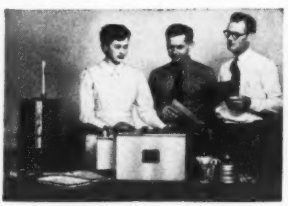
Now, an amazing new instrument that helps you master difficult moisture testing problems in a few minutes. Here's a scientific electrical tester that saves time and money and brings bigger returns from products you buy and sell.

For example, this new Steinlite Model 300, developed after years of research and extensively field-tested by leading food processors for three seasons, proves invaluable in every sweet corn packing step—because *moisture content definitely determines quality.* And higher quality generally means greater profits. The Steinlite has been successfully used to establish exact harvesting dates . . . to improve grading . . . to aid processing.

"No Special Training Required to Operate It"

Reports Oconomowoc (Wisconsin) Canning Company: *"We used the Steinlite Moisture Tester exclusively for the past three years in pre-grading, thus eliminating all guesswork in arriving at the proper time of harvest. It operates economically and accurately and we found no special training was required."*

Further, you can make a test with this Steinlite in 6 minutes . . . or less. No previous experience necessary . . . no laboratory technique required. It's low in cost . . . readily portable. You need not be near a water supply. Only a cloth is needed to wipe the equipment dry after using.



Undoubtedly moisture content is an important factor in the price, quality, processing or storage of your products. Steinlite models for testing all manner of free-flowing materials are available — in any moisture range. Already, charts for more than 200 products have been prepared. From Seedburo you can obtain the most highly developed moisture testing service in America. Describe your moisture testing problem and we will be glad to offer a solution.

SEEDBURO CHICAGO

Seedburo Equipment Company,
734 Converse Building,
Chicago 6, Illinois.

Rejoins Editorial Staff

Ivan C. Miller returns to Food Engineering's staff as an assistant editor after a tour of duty with the magazine's business and research departments.

Miller joined the "Food Industries" editorial staff in 1936 to carry out a special assignment, after which he became the publication's Eastern District representative. He returned to the home office in 1945, and recently has been acting as a consultant to both the business and editorial departments. He is well known in the food engineering field through his many food plant surveys and his thorough knowledge of food processing equipment.

compares with a Grade A yield of only 2 percent for untreated eggs and 42 percent for eggs treated with the cold oil. The thermostabilization, however, greatly reduces the whipping quality of egg white.

Pasteurization of liquid whole eggs by holding liquid at 140 deg. F. for 2 min. brings a marked reduction in bacteria, which reduces spoilage and may eventually result in easing of storage requirements.

Staley Ready for Defense

A recently completed $20,000,000 modernization program has provided the A. E. Staley Mfg. Co., Decatur, Ill., with facilities to do an outstanding production job in today's mobilization period.

The company's comprehensive construction program was launched shortly after the end of World War II. It included complete modernization of the company's corn refining facilities, and construction of both a solvent extraction unit for soybean processing and a monosodium glutamate plant.

In January 1951, just after the new facilities were operating the company processed a record total of more than 4,000,000 bu. of corn and soybeans.

And since industrial demand for starches, syrups, and oil is still on the up—a sign of accelerating mobilization—the succeeding monthly totals should be even greater.

New Birdseye Freezer

A new type of bulk freezer operating on the immersion principle was demonstrated, May 22, at the plant of Marion T. Fannaly, Inc., Ponchatoula, La. Manufactured by Worthington Pump & Machinery Corp., under patents issued to Clarence Birdseye, the unit is being used to quick-freeze strawberries.

Mr. Birdseye is well known as the inventor of the multi-plate freezer and the Gravity Froster, a bulk contact-type gravity-flow quick-freezing machine.

Conserve Plastic Supplies

An industry task group has been appointed by National Production Authority to study problems of conservation, standardization and substitution of cellophane and Pliofilm.

Members met with NPA officials, in Mid-April, and determined that the major problem currently facing the industry is that of securing adequate polyethylene supplies.

The committee said the food packaging industry should be classified in the same essential category as transportation, communications and public health. It is recommended that USDA be granted a priority rating band "in line with the overall defense program to assure adequate continuity of packaging and supply."

NPA officials stated the recommendations would be studied, but told the committee that synthetic plastics are not inexhaustible. They urged the group to develop conservation methods as quickly as possible. For the prescent no regulatory order is planned for these materials.

BAKING
DAIRY
CANDY &
FOOD
SPECIALTIES
USE THESE EDIBLE

SURFACE-ACTIVE AGENTS
(Monoglycerides)

These versatile Glyco Products are edible surface-active agents which act as emulsifiers, stabilizers, defoamers, thickeners, suspenders and softeners for the food and allied industries. They have been used with success for years in baking, dairy, candy and other food products making possible great improvements in quality and in processing efficiency.

Why not see for yourself how these Glyco materials can be used to improve *your products?* A new, condensed bulletin describing them will be sent to you upon request.

GLYCO PRODUCTS CO., Inc.
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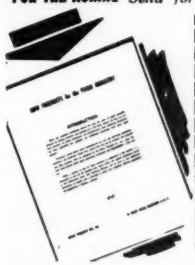
FOR THE ASKING *Send for this informative booklet.*



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"New Products For The Food Industry"

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Title .....
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City ..... Zone ..... State .....

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Imported from France

FREE FROM PRUSSIC ACID

A product guaranteed for its purity and uniformity . . . suitable for all your requirements.

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BLACK PEPPER
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DILL PICKLE
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Highly concentrated water miscible flavors ready for use "as is"

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BUTTER FLAVOR

Specialties

CAPRYL BUTYRIC ACID
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(Syntharome Imitation Butter Scotch Flavor)
DIACETYL
• IMITATION BUTTER SCOTCH BASE
• RUM AND BUTTER CONCENTRATE
• SYNTHAROME BUTTER OIL N
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• SYNTHAROME BUTTER SCOTCH OIL
• SYNTHAROME CHEESE OIL

• *Imitation Specialties . . . each superior for its own particular use.*

Our Research Department will be glad to help you on your particular problem.

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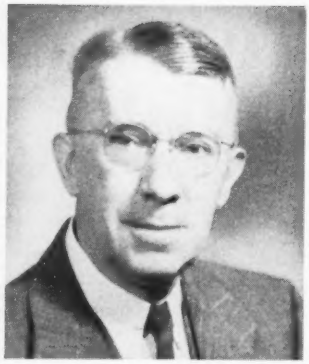


PAUL B. DUNBAR

F&DA Stays in Good Hands

Paul B. Dunbar, Commissioner of Food & Drug Administration, is retiring after nearly 44 yr. in government service. He is succeeded by Charles W. Crawford, who has been deputy commissioner. Dr. Dunbar has been with F&DA since its organization in 1927.

Serving as an inspector, from the time the Food & Drug Act of 1906 went into effect, Dr. Dunbar was later assistant to William G. Campbell, who was first official Commissioner of F&DA. In 1944 Dr. Dunbar became commissioner, naming Mr. Crawford as his deputy.

Crawford came to Washington in 1918 after service as analyst at F&DA's Chicago and New Orleans stations. In 1928 he became head of a new handling enforcement division, and was appointed assistant commissioner in 1942. He was F&DA's principal representative in discussions with legislative advisors and members of congress who wrote the present Food, Drug & Cosmetic Act, passed by Congress in 1938.

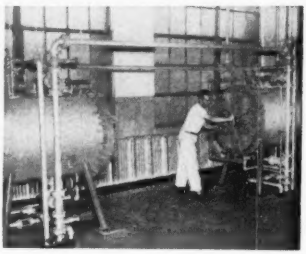
(*Turn to page* 213)

C. W. CRAWFORD

HERCULES FILTERS

Saves Time, Money

FILTERING EDIBLE OILS



—Used by leading processors of food such as soya bean, peanut, and cottonseed oils for use in mayonnaise, margarine, vegetable oil shortenings, and similar products.

1. Hercules filters are closed type filters, eliminating risk of oxidation of the oils and objectionable plant conditions that obtained when volatile oils are being processed in open type filters.

2. They shorten filtration time due to the type of filter media used and much greater flow per unit area.

3. They have lower operation costs. One man hour per cleaning once every two weeks is required. Use of loose asbestos filter material lowers operation costs a minimum of 4.2c per 1000 pounds as against filter cloth and paper.

4. No papers or cloths are used in them requiring costly time consuming washing at frequent intervals.

5. There is no lost residue of unfiltered oils at the end of each cycle.

Write for full particulars of the modern Hercules Filter for your specific filtering purpose.

HERCULES FILTER CORP.
210A-21st Ave., PATERSON, N.J.

IT'S MAGICAL...

the way metallic foil cartons increase sales and PROFITS!

A few of the nationally famous companies who use United Board & Carton foil boxes

B. F. Goodrich
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We call it the "magical formula" . . . the way our metallic foil cartons increase both sales and *Profits*. But it's really quite simple: Metallic foil reflects more light, attracts more attention . . . more favorable attention!

Metallic foil cartons always look quality. Their bright and sparkling surface sheds dust and dirt. They always look new and clean. Above all, they give the *Magic Illusion* of motion. As you walk past them, the lights they reflect vary . . . the colors they mirror change. They actually seem to M-O-V-E! That's why they stand out whether displayed alone, or on crowded counters and shelves. Storekeepers and display men like them especially for windows . . . give them the most prominent spot in every display. The result is inevitable . . . More sales, More profit.

The *Magic Formula* can actually be reduced to figures: Let us show you how it works. Just drop a letter or a postcard for your free copy of "The Magical Formula."

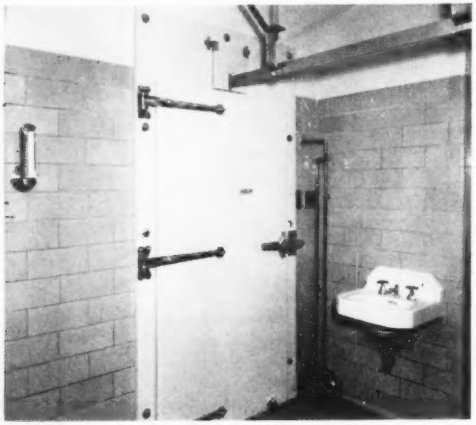
UNITED BOARD & CARTON CORPORATION

156 SOLAR ST., SYRACUSE, N. Y.

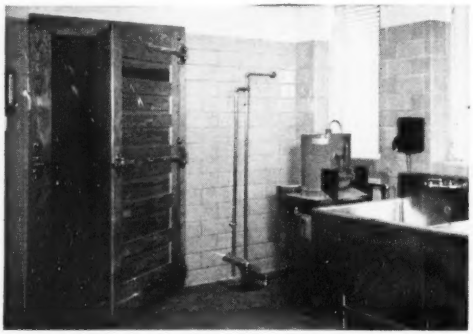
Board Mills: LOCKPORT, THOMSON, N. Y., URBANA, O.; *Carton Plants:* SYRACUSE, VICTORY MILLS, CONDES, BROOKLYN, N. Y., SPRINGFIELD, O.

JAMISON DOORS *protect* food storage at 3 places in tremendous Texas Veterans' Hospital

ONLY THE BEST is good enough for Uncle Sam's fighting sons. The VA Hospital at Big Spring, Texas, is one of the largest and finest ever built anywhere. It is the last word in modern efficiency and sanitation. So naturally, Jamison Cold Storage Doors were installed along with the rest of "*the best* equipment obtainable." Jamison Cold Storage Door Co., Hagerstown, Md., U.S.A.



MEATS . . . are handled more easily through the Jamison Track Door. Trolley allows sides to be rolled from dock into cold storage.



VEGETABLES . . . are stored efficiently at 36°F temperature, behind the Jamison Standard Cold Storage Door, before preparation in ultra-modern kitchen.

BAKED GOODS . . . Sturdy Jamison Standard Cold Storage Door at right seals the Cool Room where dough is held dormant until used.

JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

THE LEADER FOR MORE THAN 50 YEARS

Plant Modernization ...Expansion... Without Production Loss

● Call on a Ferguson First Team of engineers, designers and builders . . . Men carefully selected for their training and experience in the *Food Industry* . . . Men with a thorough understanding of *processing plant layout—equipment—instrumentation—mechanization—packaging—material handling.*

Ferguson cooperative effort can effect new economies in your plant operation, improve processing efficiency, increase capacity—without shutdown or production interruption.

Preliminary Discussions in Confidence and Without Obligation.

THE H. K. FERGUSON COMPANY
ENGINEERS AND BUILDERS

Headquarters:
Ferguson Building, Cleveland, Ohio
District Offices:
New York, Houston, Chicago, Los Angeles, Cincinnati

EXPERIENCE . . . THE FOURTH DIMENSION

Deep Sea Freezing

Since freezing fish at sea has worked out satisfactorily in laboratory and pilot plant tests, Fish & Wildlife Service recently decided to fit out a New England trawler to test the method under actual conditions. One-half of the trawler's hold will be heavily insulated and freezing equipment will be installed. The other half will be utilized for icing down fish as is now the practice.

If the new method can be worked out, says F&WS, it will insure freshness of fish when they reach processing plants. At present they must be held on ice for eight to ten days aboard the trawlers.

Other advantages pointed out are that the vessels can remain on the fishing grounds until fully loaded; liver and other material now discarded at sea can be brought ashore in perfect condition; shore plants will be able to operate on a fixed work schedule, since fish can be brought from the freezer as needed; and fish and fish fillets will be of uniform high quality. (For details of a pack-at-sea pilot operation, see this month's special article, "Floating Processing Plants," on p. 145.)

Bulk Rice Graded

An improved rice grading method is expected to make the bulk drying, storing and handling of bulk rice a more efficient operation than has been hitherto possible.

The system, as worked out with newly developed apparatus after three years of research by USDA, is this:

One thousand grams of rice are weighed out. They are cleaned, hulled, and the hulls are separated from the brown rice. A small-scale milling machine removes bran from the hulled rice, yielding white rice. The white rice is then evaluated for its head rice, broken kernels, damaged kernels, red rice, and so on.

Comparison tests (against conventional mill operations on the same lots of rice) proved the new machines practicable in actual grading work.

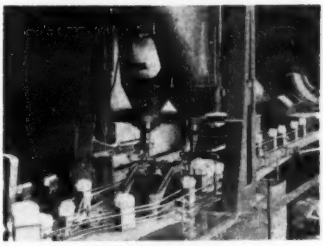
Meat's Price Story

What efforts the nation's meat packers could spare from securing dwindling supplies and keeping finished products in proper distribution were devoted last month to attempts to educate price stabilizers and consumers that ceiling prices are not the answer.

With black markets in meat looming blacker, the packers through The

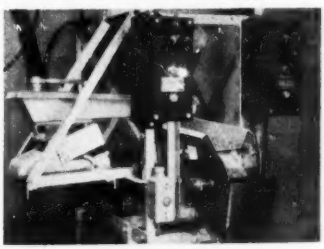
SYNTRON

Speeds Up Bulk Material Handling with—



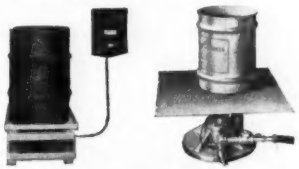
ELECTRIC VIBRATORS

Assure free-flowing bins, hoppers and chutes—eliminate arching and plugging—and damage by pounding.
A variety of models—for small 1 cu. ft. hoppers up to huge bunkers.



VIBRATORY FEEDERS

Variable control of rate of flow—from pounds to hundreds of tons per hour of most all types of dry or damp bulk foods.
Low installation cost—low maintenance cost.

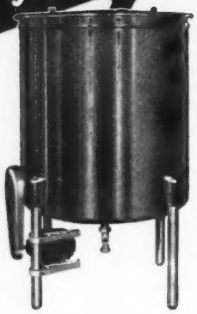


PACKERS & JOLTERS

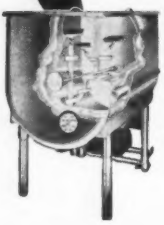
Eliminate slow, laborious hand pounding, bumping and jarring—enable you to put more into your containers—and your customers to get more out of them.

SYNTRON CO.
460 Lexington Ave. Homer City, Pa.

There's a
STAINLESS STEEL
SAN-I-TANK for every kind
of food processing and storage



For example, Type "J" is a single shell tank, available in capacities from 60 to 1000 gallons, that will take standard fittings of all kinds, is especially adapted for storage or mixing purposes.

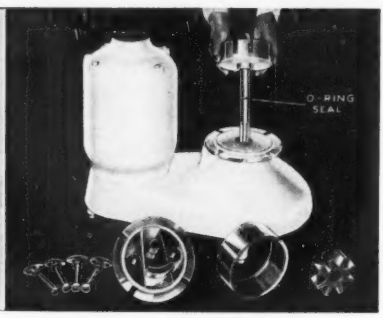


Type "CHR" is a jacketed tank for heavy or light processing, for cooking or cooling, and equipped with the famous horizontal "wiping action" agitator.

Write today for Bulletin SS-50, which describes Type "J" and other single shell tanks in detail. Write for Bulletins CHR-50 and JS-50 for detailed information about jacketed tanks.

STAINLESS STEEL SAN-I-TANKS
METAL GLASS PRODUCTS COMPANY
BELDING 6, MICHIGAN

Help
YOURSELF
to MORE *and*
BETTER
PUMP
SERVICE



The bulletin of "Instructions For Viking 'Sanitor' Unit" will help you to give proper care and secure best service from your Viking "Sanitor" pumps. You will aid national defense by making your pumping equipment last longer.

For your copy of the Viking "Sanitor" pump bulletin E, clip and send this ad to

VIKING
AN HONORED NAME IN PUMPING

See Our Catalog in SWEETS

Viking PUMP COMPANY
Cedar Falls, Iowa

Switch Presidents

A. L. Elder (right), takes over as president of the Associates, Food & Container Institute, at the organization's 4th annual meeting in Washington. Research director at Corn Products Refining Co., Dr. Elder is seen here with retiring president, Daniel M. Dent, general manager of the Borden Co.'s manufacturing department, New York City.

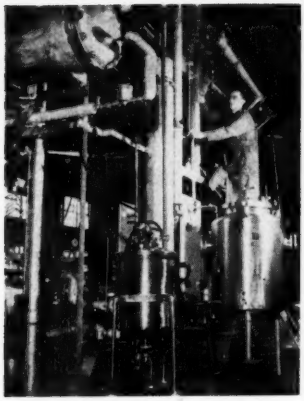
American Meat Institute tried to explain what happens when meat eaters get their hands on enough money to buy more meat than the industry can supply. But after explaining that the supply of livestock cannot be increased overnight, the discussion became a little fuzzy.

For instance, they declared that "farmers and ranchers say livestock production will be discouraged by continuance of man-made regulations designed to set aside the law of supply and demand. Nobody has ever been able to repeal that law in a free country."

Unfortunately such broad generalities are not considered very convincing. A more realistic argument, say observers, would be that price ceilings won't work because a great segment of the public is willing and able to pay exorbitant prices for meat. And as in any other industry, livestock suppliers will take the highest price they can get for their product, regardless of government regulations that a large portion of the public likewise prefers to ignore.

Short On Fruit

Prospect of another year of short fruit crops in the Pacific Northwest is causing concern in the area's canning industry. Reports indicate that killing frosts have slashed cherry, prune, peach, and apricot crops 50 to



Apple Essence

Western Regional Research Lab, of USDA, is using its juice concentrate equipment to further the work on apple concentrate begun by the Eastern Regional Research lab. In processing an essence fraction is recovered from the fresh juice and put back into the concentrate. The pilot equipment used for this essence recovery is shown here. (Wide World)

85 percent in such producing centers as Wenatchee, Wash., and Hood River and Milton-Freewater, Ore.

This slim crop prospect finds the region's canning industry with small carry-overs from the short 1950 crop. Stocks on hand April 1, compared with the same date last year, were reported as follows by the Northwest Canners Assn.:

Sweet cherries, 75,337 cases this year, 277,282 cases last year; peaches, 46,321 and 281,863; purple plums, 205,072 and 479,382; pears, 905,946 and 883,938; apples, 257,890 and 110,187.

Blatz Boosts GI's

A plan recently adopted by Blatz Brewing Co. provides liberal wage payments and other benefits to eligible employees serving in the armed forces. Retroactive from June 25, 1950, the plan covers 30 employees already in military service and all others who will enter during the national emergency.

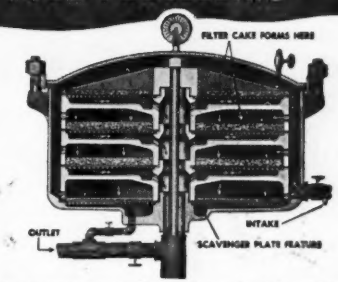
The program, as explained by Pres. Frank C. Verbest, was formulated by Blatz's parent company, Schenley Industries, Inc., and applies to all Schenley subsidiaries throughout the country. Manner of entering the service, whether voluntary or involuntary, will have no bearing on eligibility.

The official said all service men and women who were on the Company's

FOR HIGH SPEED, UNIFORM FILTRATION REQUIRED IN FOOD PROCESSING

SPARKLER horizontal plate FILTERS

Capacities 50 G.P.H. to 5000 G.P.H.



HERE ARE A FEW FOOD PRODUCTS THAT SPARKLER FILTERS HANDLE WITH EASE:
Candy Scrap
Chicken Broth
Cider
Egg Albumen
Extracts
Flavors
Honey
Gums
Liquors
Milk
Molasses
Vegetable Oil
Syrups
Vinegars
Wines
Fruit Juices
Alcohols
Alkalies
Beverages

Sparkler Filters operate on a distinctive principle, using horizontal plates, that are particularly efficient in maintaining uniformity in operation over a wide range of pressure, temperature, or viscosity conditions.

Filters water sparkling clear, removes all off-tastes, odors, color, sediment, chlorine, sulphur, algae, pipe rust, etc.

Because filter media are supported on a horizontal plane and filter aids floated into position uniformly, filtration takes place uniformly over entire filtering areas. Flow through filter is always with gravity. The patented scavenger plate filters the last drop, leaving no hold over in batch filtration.

We invite correspondence on your problems. You will receive the advice of filtration engineers with over a quarter of a century experience in a specific field.

SPARKLER MANUFACTURING COMPANY
MUNDELEIN, ILLINOIS

Wherever Foam's a problem . . . .
DOW CORNING ANTIFOAM A
EFFECTIVE IN FOAMERS RANGING FROM ADHESIVES TO ZEINS INCLUDING FOODS AND DRUGS

DOW CORNING SILICONES
DOW CORNING CORPORATION
Midland, Michigan

Please send FREE SAMPLE to
Name
Title
Company
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City State

QUICK SUGAR ANALYSIS

HAND REFRACTOMETER

Pocket-size — designed especially for fruit, vegetable growers, candy manufacturers, canneries, and other food processors. Gives rapid sugar or dissolved solids analysis with a few drops of sample.

Simple to operate, calibrated directly in percentage. Two ranges available.

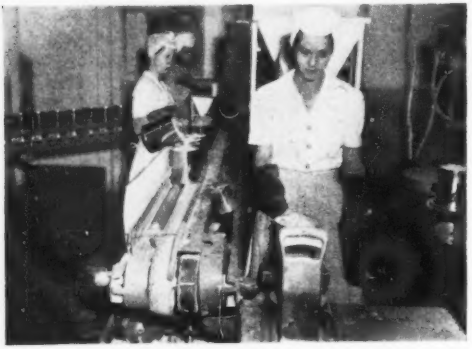
0—32% by 0.2% divs.
30—66% by 0.5% divs.

Price $69.00—either range.

Conversion tables to give Refractive indices supplied.

LABORATORY EQUIPMENT CO.
526 Folsom St.
San Francisco 5, Calif.

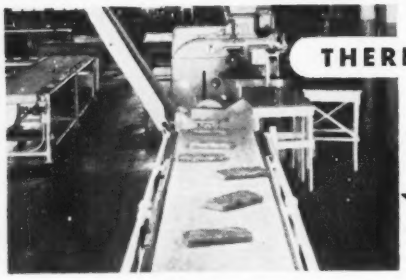
Are there costly "leaks" in your Weighing Operation?



EXACT WEIGHT end-tower Scale checkweighing dehydrated onions in the Gilroy Calif. plant of Gentry Inc.,

The fact that your present scales are simply accurate is not enough today. Ask yourself these questions (1) do they fit your operation (2) are they geared to other production line equipment as to speed and adaptability (3) do they require more labor to use than they should (4) do you have weighing duplication. Searching appraisal of these questions can stop costly leaks for you . . . especially in volume packaging of consumer food products. EXACT WEIGHT Scales, strictly for industrial use, stop these costly leaks because they are built for the particular food operation involved, as to speed of operation, production line layout and capacity to save time, money, product and manpower. Write for full details to fit your business.

EXACT WEIGHT SCALES
Industrial Precision
THE EXACT WEIGHT SCALE COMPANY
910 W. Fifth Ave., Columbus 8, Ohio
2920 Bloor St., W., Toronto 18, Canada



THERE'S A JOB FOR SUPRENE BELTING

Wherever Food Is Processed

Whether you're processing fruit, vegetables, fish or meat, SUPRENE's the answer to your belting problem. SUPRENE is strong . . . thanks to heavy, tightly-woven duck, Neoprene-impregnated. It's waterproof, stable and durable. It withstands extremes of temperature . . . from below zero to 250°F. It's available in four styles, a variety of thicknesses and in widths up to 48-in. and can be furnished endless. Most important of all to you as a food packer, SUPRENE is completely sanitary. The special impregnation is highly resistant to vegetable, mineral and fruit acids and oils. Hot water or live steam can be used to wash the smooth surface quickly and completely. What's more, there's no danger of particles of belting checking off. Investigate SUPRENE. It's ideal for all food service. Send for bulletin.

Victor
Balata & Textile Belting Co.
53 Park Pl., N.Y. 7 • 300-6 W. Hubbard St., Chicago 10
Factory: Easton, Pa.

Weighty Matter

If you are interested in lemon drops, this is the largest one ever produced. It's a 250 lb. job made to exploit a movie Marilyn Maxwell is playing in. Natcherly, the gal is M. M. (Wide World)

payroll continuously from June 25, 1950 to induction will draw full pay for their first three months in uniform and one-fourth pay each month thereafter. Inductees with unbroken company service, but hired after June 25, 1950, will receive a lump sum equivalent to one-fourth pay for each month of Blatz employment. First payments are expected to go out within the next few weeks. They will be made in cash or savings bonds, to either the employee or his dependents.

Other major provisions include full credit toward pension and seniority benefits for time spent in uniform; re-employment upon honorable discharge, and hospitalization insurance for the employee's dependents at company expense during the time he is in service.

Texas Dairy Course

Lectures and demonstrations on cheese, cottage cheese, milk, butter and ice cream will be included in the third annual dairy manufacturers short course at Texas Technical College, Lubbock, Tex., Nov. 14 to 16.

FDA Food Standards

Status of food standards of Food & Drug Administration in early May is reviewed below:

Future Hearings

1. *Salad dressing* standards will be

subject of rehearing on the use of "cream, milk and milk products" as optional ingredients, following the March 21 decision of Third Circuit Court of Appeals in answer to petition of Cream Wipt Food Products Company, Philadelphia. No date has been set.

2. *Process cheese food* standards will be subject of hearing on industry proposals to permit skim milk cheese as an optional ingredient. No date has been set.

3. *Canned pineapple and canned pineapple juice*, standards of identity, quality, and fill of container. Postponed hearing scheduled for October 15, 1951. Details not yet available.

4. *Canned tuna*, hearing rumored but no date set; initiative of Administrator.

5. *Frozen vegetables*, hearing rumored but no date set; initiative of Administrator.

Hearing in Progress

Ice cream, new, standard of identity. Emulsifiers and stabilizers (functional use only, no toxicology) were discussed for approximately four weeks during April and early May. Flavoring and sweetening ingredients were also discussed briefly, then a recess was taken until Jure 11. Minimum fat content, total milk solids, mineral salts, standardization of acidity, sherbets, ices, frozen custard, and French ice cream were scheduled to follow in that sequence. Miscellaneous items not previously classified and finally pharmacology and other technical evidence concerning surface active agents should bring the ice cream hearing to an end in July.

Tentative Orders Awaited

1. *Residue tolerances*, on fresh fruits and vegetables; new. Expected in summer; hearing adjourned in September 1950; briefs were filed until December.

2. *Fruit preserves, jellies, and butters*, amendments, standards of identity. Expected soon; hearing adjourned in January; briefs were filed until March.

3. *Evaporated milk*, amendments, standard of identity. Expected soon; hearing held in March; briefs due in March.

4. *Margarine*, amendments, standard of identity. Expected soon; hearing adjourned in early April; briefs could be filed until May 21.

Final Orders Awaited

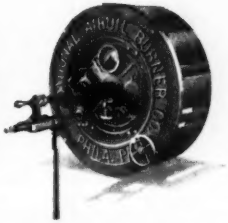
1. *Canned corn*, amendment, standards of identity, quality, and fill. Expected soon; tentative order pub-

REGISTER TYPE COMBUSTION UNITS . . .
FOR YOUR "CONICAL FLAME" REQUIREMENTS

UNIVERSAL (REGISTER TYPE) COMBUSTION UNIT

Can be furnished with Gas Burners or steam or mechanical atomizing Oil Burners, for either natural or forced draft. Air vanes are variable independently of each other and adjustable or instantly reversible from left to right hand turbulence or vice versa as a unit. Has a dual feature for controlling air volume, independent of turbulence. Capacities up to 500 gals. of oil (60,000 lbs. steam) per hour.

MECHANICAL-PRESSURE ATOMIZING OIL BURNERS



Mechanical-pressure atomizing (marine type) oil burners for firing high pressure steam boilers. Capacities 10 to 500 gals. per hour. Require oil pressures of 75 to 300 lbs. per sq. in. and oil temperatures up to 300° F., depending on grade of fuel oil and furnace design. Standard or wide range types. Air Registers available for natural or forced draft.

LOW AIR PRESSURE OIL BURNERS

Type LAP Burner and Register, shown mounted on furnace wall with Indicating Air and Oil Control Valves. The Type LAP Oil Burner is for use with low pressure air for firing forging, reheating, heat treating furnaces, crucibles and other metal melting furnaces, core ovens, galvanizing kettles, dryers, bake ovens, cookers, air heaters, kilns, glass tanks, glory holes, enameling furnaces, asphalt kettles and other process furnaces. (Patented July, 1943.)

Where it is preferable to use the cone flame for firing steam boiler and other industrial furnaces, NATIONAL AIROIL BURNER CO. offers these Register Type Combustion Units in several types, and models for either natural or forced draft.

NATIONAL AIROIL BURNER CO. stands ready to serve your every need or special problem when it comes to Oil Burners—Gas Burners and allied equipment. We feel that you'll be interested in the full particulars we give regarding your oil-gas combustion requirements . . . Write us today, won't you?

OIL BURNERS and GAS BURNERS for industrial power, process and heating purposes; STEAM ATOMIZING OIL BURNERS; MOTOR-DRIVEN ROTARY OIL BURNERS; MECHANICAL PRESSURE ATOMIZING OIL BURNERS; LOW AIR PRESSURE OIL BURNERS; GAS BURNERS; COMBINATION GAS and OIL BURNERS; AUTOMATIC OIL BURNERS, for small process furnaces and heating plants; FUEL OIL HEATERS; FUEL OIL PUMPING and HEATING UNITS; FURNACE RELIEF DOORS; AIR INTAKE DOORS; OBSERVATION PORTS; SPECIAL REFRACTORY SHAPES.

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increases production
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● In a Detroit pickle plant, faster production through a short season, less manual handling, lower production costs and improved product appearance resulted from installation of a conveyor system utilizing Cyclone Stainless Steel Flat Wire Metal Conveyor Belt. Pasteurizing and cooling take place automatically as the product moves along.
Perhaps one of the three types of Cyclone Metal Conveyor Belt—Flat Wire, Chain Link or Flex-Grid—can make possible faster, more efficient operations in your plant. For complete information, contact the nearest Cyclone sales office; they're in most principal cities. And write for Catalog No. 4 today.
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When You Use Low Temperature
USE CORK

The time to make sure of your insulation protection is before you build or expand. Get the facts on Cork insulation when they can do the most good. Cork is so efficient in insulating properties that its performance has long been the accepted standard for low temperature requirements. Its wide usage in the refrigeration industry is due to its proved record for more than 40 years. Mundet refrigeration engineers are experienced in all details of temperature control. Write to us now for recommendations and estimates . . . let us help you secure the most profitable use of low temperature. Mundet Cork Corporation, Insulation Division, 7101 Tonnelle Ave., North Bergen, N. J.

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CORK INSULATION

lished in April 1950, exceptions filed in May.

2. *Bread,* new, standard of identity. Expected soon; effort being made to issue final order as soon as possible; tentative order published August 1950, exceptions filed in November.

3. *Frozen fruits,* new, standards of identity and fill. Expected soon; tentative order published in October 1950, exceptions filed in January.

4. *Canned mushrooms,* amendment, standards of identity and fill. Expected soon; tentative order published in February; exceptions filed in April.

Standards Completed

None since last reported (FOOD ENGINEERING, April 1951, page 226).

USDA Grade Standards

Recent actions by Production & Marketing Administration of U. S. Department of Agriculture on U. S. Grade Standards and related activities include the following:

Ready-to cook domestic rabbits, revised, proposed, page 3349, April 17 *Federal Register,* written comments received until May 2; proposed revisions would permit only those rabbits which have been officially inspected for condition and wholesomeness to be graded for quality.

Pecans in the shell, revised, proposed, page 3485, April 21 *Federal Register,* written comments received until May 21.

Maple syrup, revised, proposed, page 3487, April 21 *Federal Register,* written comments received until July 20.

Poultry, grading and inspection regulations, amended "to extend the period of exemption of dressed poultry from the provisions of the sanitary requirement from May 1 to July 1, 1951" as a result of industry requests prompted by scarcity of facilities and equipment needed to bring processing plants into compliance with regulations; proposed amendment, page 3488, April 21 *Federal Register,* written comments received until April 26; amendment promulgated, page 3827, May 2 *Federal Register,* effective May 1.

Canned lima beans, third revision, page 3607, April 27 *Federal Register,* effective May 27.

Frozen lima beans, fourth revision, proposed, page 3621, April 27 *Federal Register,* written comments received until May 27.

Rough rice, brown rice, and milled rice, revised, page 3881, May 3 *Federal Register,* effective July 1, 1951.

Hops, revised, proposed, page 4257, May 8 *Federal Register,* written comments received until June 7.

FRICK

Air Conditioning and Refrigeration Serve Largest Super-market in Middle West

Bettendorf's new store in St. Louis measures 164 ft. by 160 ft., has 200 employees. Two NEW "ECLIPSE" compressors provide air conditioning, while seven other Frick units cool eleven rooms—for meats,

bakery products, vegetables, frozen foods, process works, etc.

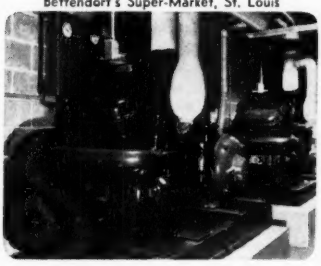
Installation by L. V. Fleiter Co., St. Louis Distributors who have put Frick cooling equipment in five other super-markets recently.

Let us quote on the air conditioning, ice-making, refrigerating or quick-freezing equipment you need.

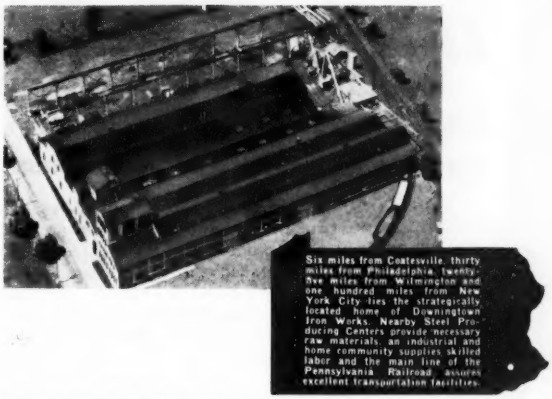
DEPENDABLE REFRIGERATION SINCE 1862
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery

Frick NEW "ECLIPSE" Compressors at Bettendorf's Super-Market, St. Louis



The Home of CUSTOM-MADE PRODUCTS


Six miles from Coatesville, thirty miles from Philadelphia, twenty-five miles from Wilmington and one hundred miles from New York City—lies the strategically located home of Downingtown Iron Works. Nearby Steel Producing Centers provide necessary raw materials, an industrial and home community supplies skilled labor, and the main line of the Pennsylvania Railroad assures excellent transportation facilities.

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Nearly 40 years ago the present management of DOWNINGTOWN IRON WORKS, INC. began to attain, and then maintain, the reputation of being "*among the finest in their field*"; i.e., Steel Plate Fabrication. We, of DOWNINGTOWN, take justifiable pride in knowing that through these years we have never once sacrificed *quality* for price. The many developments in the variety of metals and methods of fabricating these metals have made our work most interesting, and we also like to feel that *we* have contributed, in a small way, to advancing the economy of our Country.

Our Heat Transfer Division, started in 1941, is maintained under the direction and supervision of men thoroughly trained and experienced in this line.

Heat Transfer Equipment of DOWNINGTOWN design is sold on a guaranteed performance basis or we will fabricate to customer's drawings. Useful literature gladly sent upon request on your Business Letterhead. May we be of help to you? Remember, "Your needs are our Specialty!"

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DOWNINGTOWN, PA.
STEEL & ALLOY PLATE FABRICATION
HEAT EXCHANGERS

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NO Creep • NO Weave • NO Jump

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FLEXIBLE STEEL
CONVEYOR BELTING

Insures Faster, More Efficient Food Processing

Perfectly flat, shape-retaining and highly resistant to corrosion, heat and cold, rugged LaPorte Conveyor Belting provides many trouble-free years of economical service. It is equally adaptable to freezing, canning, dehydrating, on sorting tables, in washers or cookers and every other food manufacturing process . . . and it greatly reduces time consumed from bin to shipper. LaPorte Belting is easily cleaned with steam or scalding water.

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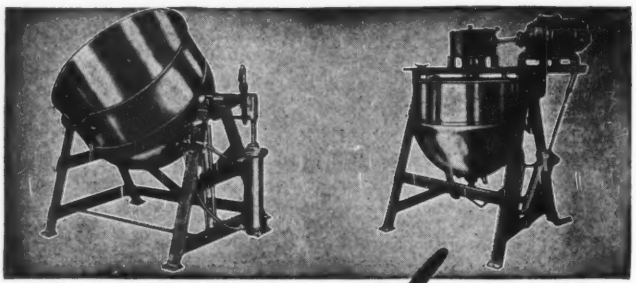
LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA



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ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE

Schedule of Events

June

3– 7—National Confectioners' Assn., 68th convention, 25th candy industries exposition; Stevens Hotel, Chicago.

17–21—Institute of Food Technologists, 11th annual meeting; Statler Hotel, New York City.

21–23—Grocery Manufacturers of America, mid-year meeting; Greenbrier, White Sulphur Springs, W. Va.

August

21–25—National Assn. of Sanitarians, 15th convention; Miami Beach, Fla.

Must Weigh Atom Damage

Federal "Civil Defense" officials point out the danger of contamination of exposed food and water in the event of atomic bomb bursts. It looks as though food engineers may have to become atomic physicists in order to measure the emergency levels of permissible radio-activity in drinking water and in food. Specific technical figures are available from Civil Defense Administration. Data provided will assist in serving communities in emergencies as well as for plant control after such episode results in exposure of raw material.

Summer Laboratory Course

Research workers, recently entered in the field of electron microscopy, will again have the opportunity of enrolling in Cornell University's Summer Laboratory course in "Techniques and Applications of the Electron Microscope."

The course will extend from July 9 to July 21. Inquiries should be addressed to Prof. Benjamin M. Siegel, Department of Engineering Physics, Rockefeller Hall, Cornell University, Ithaca, N. Y.

—*End*—

CMP: What It Is

—*Continued from page 93*

Defense program. However, on-the-shelf equipment and supplies are pretty well used up. So with demand growing apace and production curtailed, a difficult period can be foreseen. Drastic steps should be taken to assure a more equable share of basic materials than appears to have been allotted to the food industry thus far by NPA.

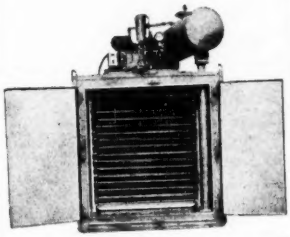
What Can Be Done About It

The Secretary of Agriculture has the authority and responsibility to see

IN QUICK QUALITY FREEZING the *Amerio*

CONTACT PLATE FREEZER

(Patent Applied For)



(Illustrated Model B 15 Stations)

Gives You Complete Control of the Quality of Your Production. Plus the Utmost in ECONOMY.

Send For New Illustrated Brochure

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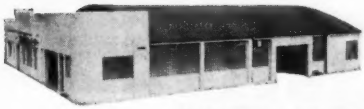
OVER THE BARREL



- BUT GOOD!

This crew is applying PC Foamglas on the barrel-shaped roof of the Taylor-Hardy Dairy Company plant, Decatur, Ill. Architect: William H. Weidemeyer, Decatur, Ill.

● Whether the roof you want to insulate is flat, pitched, or barrel-shaped, when it comes to keeping perishable food products at uniform temperatures, the constant insulating value of PC Foamglas makes it the most satisfactory material you can use.

Foamglas has proved its ability to insulate walls and floors, roofs and ceilings, piping and fittings, tanks and processing equipment, over unusually long periods of time. Freedom from costly repairs, maintenance and replacement, make Foamglas an exceptionally economical insulation.

You will find a lot of helpful data in our current literature. Just send for your free copies and a sample of Foamglas.

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PITTSBURGH 22, PA.

The best glass insulation is cellular glass. The only cellular glass insulation is PC Foamglas. This unique material is composed of still air, sealed in minute glass cells. It is light-weight, incombustible, verminproof. It has unusually high resistance to moisture, chemicals and many other elements that cause insulation to deteriorate.

Pittsburgh Corning Corporation
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Pittsburgh 22, Pa.

Please send me without obligation a sample of Foamglas and your FREE booklet on the use of PC Foamglas Insulation for: Normal Temperature, Commercial, Industrial and Public Buildings ☐ Refrigerated Structures ☐ Piping and Equipment ☐.

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PITTSBURGH PC CORNING **FOAMGLAS** cellular glass **INSULATION**

When you insulate with **FOAMGLAS** *... the insulation lasts!*

DETECTO SCALES

There's a precision-accurate Detecto Scale for your specific weighing and counting need. The Detecto helps increase production, yet assures you maximum accuracy by making slightest weight discrepancies immediately visible.

DETECTO POST-O-METER

The Modern Parcel Post Scale. Just press the zone key. There's one figure—the correct postage—illuminated, easy-to-read.

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MAKERS OF FINE SCALES SINCE 1900

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SCALE ENGINEERS IN ALL PRINCIPAL CITIES

that the food processing industry is able to meet the requirements of an expanding military and export program, in addition to taking care of civilian requirements of the 1951 season. But he cannot be expected to claim essential raw materials for food processing equipment until the facts demonstrating the need are presented to him. Until the food industry decides the kind of a program it needs (and Agriculture is available with plenty of assistance), spot dislocations and shortages will continue to cause hardship. And OMF will find it ever more difficult to lend assistance under CMP, because from now on essential materials cannot be taken from the military.

A preliminary survey to ascertain the needs of the food processing industries from July 1, 1951, to June 30, 1952, resulted in the startling information that 150 percent of the country's ingot steel capacity for the same period would be required. Such unrealistic figures are not usable. Yet NPA's base period (first two quarters of 1950) is not much more realistic. To avoid hardships, the food processing and food equipment industries must give the government some good data on future requirements.

End (Resume reading on p. 94)

ASRE REFRIGERATING DATA BOOK

Third Edition Applications Volume

REVISED, UP-TO-DATE, NEW EDITION
NOW AVAILABLE AT THE SAME LOW PRICE!

Discusses:	Contains:
Frozen foods	8 sections—81 chapters
Cold storage practice	More than 1,000 pages
Refrigeration in food manufacture	Complete references
Refrigerated food distribution	Increased index
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	128 tables—427 illustrations

Most complete information available in one volume on the application of refrigeration in its many and varied uses.

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We'll make a test grind with

SCHUTZ-O'NEILL PULVERIZER

You will receive our Engineering Report suggesting the best method to use and the type of Schutz-O'Neill Pulverizer and any receiving or sifting equipment suited to your requirements.

SCHUTZ-O'NEILL offers you the benefit of more than a half century of experience in rapid, accurate, dustless pulverizing of any dry, grindable, non-gritty stock.

SCHUTZ-O'NEILL Pulverizers are made in 6 sizes with capacities up to 2000 lbs. per hr. Also Gyrator Sifters, Roller Mills, Receiver Boxes, Collectors, Hammermills, etc.

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Dependable DODGE TRUCKS are "Job-Rated" to slash costs

Are high hauling costs nipping your profits? Then switch to trucks that fit your job—Dodge "*Job-Rated*" trucks.

With new Dodge "*Job-Rated*" trucks, you haul bigger payloads. You haul faster, too. You get new power to cut down your time on the road—economical power to save on gas and oil. And you get improved visibility and new handling ease for more speed through traffic.

What's more, thanks to new lower loading heights, you spend less time at each stop. And with famous Dodge *dependability*, you get a truck that will save you money for years to come.

Find out how much you can save in operating and upkeep costs with a Dodge "*Job-Rated*" truck that's at home on your job. See your nearby Dodge dealer today.

"Job-Rated" TRUCKS DO THE MOST FOR YOU

How Dodge trucks are "*Job-Rated*" for hauling foods

A Dodge "*Job-Rated*" truck is engineered *at the factory* to fit a specific job . . . save you money . . . last longer.

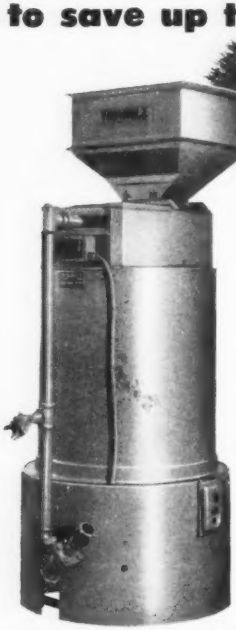
Every unit from engine to rear axle is "*Job-Rated*"—factory-engineered to haul a specific load over the roads you travel and at the speeds you require.

Every unit that SUPPORTS the load—frame, axles, springs, wheels, tires, and others—is engineered right to provide the strength and capacity needed.

Every unit that MOVES the load—engine, clutch, transmission, propeller shaft, rear axle, and others—is engineered right to meet a particular operating condition.

USE LIQUID GLUE?

Here's an easy way to save up to 60%



The VISCO-MAT system converts dry adhesive into ready-to-use liquid to give you 6 savings!

ALL your operator does is put *dry* adhesive into the hopper and set the control dial in the base for the right viscosity. The VISCO-MAT *automatically* measures and mixes the water needed to produce this desired viscosity.

This NEW method of glue preparation SAVES—*money*, you're not paying for the water in the glue—*Labor* in mixing and handling—*freight* on tap water—*waste* of improperly mixed batches—*time*, there's no waiting—*space*, bags take less storage room than drums. The overall savings may reduce your adhesive costs as much as 60%.

The VISCO-MAT system of automatic preparation and continuous viscosity control has proven its ability to cut adhesive costs in the food . . . chemical . . . paper . . . and boxboard container industries. Write for details.

Ask for BULLETIN No. 800

TRIANGLE PACKAGE MACHINERY CO.

6650 W. Diversey Ave.
Chicago 35, Illinois

Men & Companies

Industry

Adolphus Rice Mills plans to build a rice bran oil extraction plant in Houston, Tex., which the company claims will be the world's largest. To be named the Wonder Rice Oil Co., the building and equipment is expected to cost in excess of $500,000. This is in addition to a previously announced $2,500,000 expansion program.

Boone County Foods, Inc., is the name of a new corporation formed by G. S. Suppiger & Associates. The company has taken over the Ladoga plant at Lebanon, Ind., where it will process catsup, canned tomatoes, Mexican style beans, pork and beans, and hominy.

Canadian Fishing Co. has completed a salmon cannery at Prince Rupert, B. C. Cost was approximately $650,000. The plant is expected to go into production sometime this season.

Consolidated Grocers Corp., has acquired two California food companies, Gentry, Inc., dry food seasoning manufacturer and Union Sugar Co., beet sugar producer.

General Foods has taken over Nampa Products Co., packer of quick frozen lima beans. Operating under GF's Birds-Eye Division, Nampa hopes eventually to add spinach, broccoli and asparagus to its output.

General Mills is planning construction of a 250-ton-per-day soybean processing plant at Rossford, O. Blaw-Knox will do the engineering and construction.

Bruce Durling is now a vice-president of Wm. J. Stange Co., Chicago. Son of the company's president and general manager, he has had experience in all phases of the firm's operations.

Ian R. Dowie has been elected president of Brewing Corp. of America, according to E. P. Taylor, board chairman. He succeeds George M. Black, Jr., who moves up to vice-chairman of the board.

Krim-Ko Corp. is building a new chocolate syrup plant in Houston, Tex., with completion expected by late July. Later the company expects to add ice cream, bar coating and cocoa powder to the plant's production line.

Kuner-Empson is completely modernizing its Grand Junction, Colo., plant, planning to spend $125,000 over the next three years for construction and equipment.

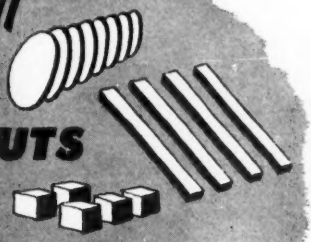
Lucerne Milk Co., Oakland, Calif., has started construction on a 2,500-gal.-a-day fluid milk plant at Phoenix, Ariz. Cost is estimated at $300,000.

Maderia Food & Materials Co., Tulsa, Okla., has leased a former dairy plant at Sand Springs, Okla., to can fowl for the armed forces. A modern canning plant is to be installed and the company plans to continue the operation after government contracts have been filled.

National Dairy Product Corp. has elected G. C. Pound and James Bruce to the executive committee. Mr. Pound has been executive vice-president of Kraft Foods since 1944. Mr. Bruce, a former National Dairy vice-president, was until recently Ambassador to Argentina.

Pet Milk Co. has bought the Paris, Ark., milk processing plant of Avoset Co., San Francisco. The plant is to be used as a receiving station for Pet's Siloam Springs proc-

This ONE unit SLICES STRIP-CUTS DICES



- Baby foods • Pickles • Preserves
- Cherry dicing for ice cream dips
- Pineapple dicing for crushed pineapple
- Slicing julienne peaches • Maraschino cherries
- Peanuts, walnuts, pecans
- All types of fruits and vegetables
- Chicken, corned beef for salad and sandwiches

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Why grind, smash or macerate your products when you can be sure of uniform, clean-cut, firm pieces.
- **End production bottlenecks**
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manufacturers of precision, high speed cutting equipment for delicate food products

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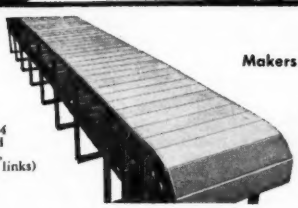

Model 614
Illustrated
(6" pitch,
14 gauge links)

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Steel-Parts steel belt conveyors give you a clean, flat sagless surface of steel . . . easy to clean, economical to use. If you need one conveyor or an entire conveying system — Steel-Parts have just the right unit, engineered to do your job best.

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- ☐ Send full details and specifications, including engineering data, on your Steel Belt Conveyors.
- ☐ Have your engineer call to discuss our problems.

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Firm_____
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Prentiss WARFARIN *Concentrate*

is unfair TO RATS

RAX does not discriminate! It kills them all. Here's a new Prentiss product that's a sure-cure for your pest-control problems. **RAX** is a tasteless and odorless rodenticide that is easily combined with any number of different baits. No chance of rats detecting its presence. Rax is the Prentiss name for *genuine* warfarin concentrate.

RAX, containing warfarin* (WARF Compound 42) kills by producing internal hemorrhage. It is a cumulative poison, so the chance of accidental poisoning of humans or pets is relatively minor. Results from all over the country indicate that RAX is 85-90% effective in killing rats and mice.

DONT MISS THE READER'S DIGEST MARCH WARFARIN ARTICLE

The use of RAX Powder in structural pest control operation offers sanitation directors and pest control operators a potential opportunity to place rodent control on a satisfactory basis—something not heretofore possible with available rodenticides.

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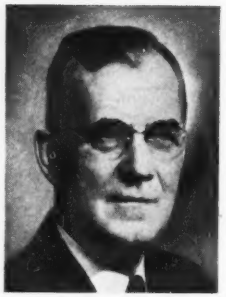

A. E. Stevenson has been chosen to receive the 1951 Nicholas Appert Award made by the Chicago section of IFT. He is a technical research assistant with Continental Can Co.

essing plant and may be expanded to a condensery if volume is built up.

Shedd-Bartush Foods, Inc., Detroit, has started construction of a plant at Dallas, Tex. To be ready in July, the plant will be the distributing center for southwestern and Rocky Mountain states and California.

Tea Garden Products Co., producer of jams, jellies and specialty items, will move operations to San Leandro from San Francisco in the fall, when its new $400,000 plant will be completed.

Personnel

B. F. Beach was re-elected chairman of the American Dry Milk Institute at its recent annual meeting. All other officers were also re-elected with B. W. Fairbanks continuing as executive officer.

Russell B. Becker has been named secretary and treasurer of Peters Sausage Co., Detroit. He succeeds Albert W. Bradley, who is retiring after 56 yr. with the company.

Silvio Crespo has joined C. J. Patterson & Co., Kansas City, Mo., as a research chemist. He held a similar position with the American Institute of Baking, Chicago.

R. Adams Dutcher, head of the department of agricultural & biological chemistry and chairman of the council on research, Penn State College, will retire July 1. He plans to devote full time to technical writing and consultation work on foods and nutrition. He has been department head since 1921.

Harvey G. Ellerd has retired as a vice-president of Armour & Co. He had been with the company since 1907.

J. W. Greene is new superintendent of the Chicago plant of Swift & Co., succeeding W. L. Armstrong, retired. Mr. Greene held a similar position at Swift's in South St. Joseph, Mo.

Wallace F. Janssen has been appointed Assistant to the Commissioner of the Food & Drug Administration. Mr. Janssen will direct F&DA's trade and public information activities. He was formerly managing editor of *F-D-C Reports*, a Washington newsletter specializing in the drug and cosmetic fields.

Mrs. Ethel Austin Martin retired June 1 as director of National Dairy Council's department of nutrition service. She will serve, however, as a special consultant to Milton Hult, NDC president. Mrs. Martin has been with the Council since 1929.

Victor Marx, for the past nine years in charge of the bakery division, American Dry Milk Institute, resigned effective June 1. He continues as secretary-treasurer of the American Society of Bakery Engineers.

George E. McDearmid has been named vice-president in charge of the California Fruits Div. of Libby, McNeill & Libby, succeeding Leroy J. Taylor, who has retired after 50 yr. with the company.

Oscar McPeak, assistant general counsel, has been appointed assistant secretary of General Foods Corp. He joined the corporation in 1929.

F. J. Otterbein has been named president of General Foods, Ltd., Toronto, Canada,

Ernest W. Reid is the newly elected president of Corn Products Refining Co., succeeding Morris Sayre, who has been elected vice-chairman of the board.

Sandvik Steel Belt Conveyor for Meat Packing

A Sandvik conveyor has special ability to HANDLE MATERIALS THAT ARE...

STICKY
CORROSIVE
HOT
OILY
SENSITIVE TO CONTAMINATION
SANITARY (Food)

A Sandvik conveyor's extra ability to handle difficult materials comes from its solid steel belt.

Here are some Sandvik advantages that cut handling costs.

- Long service life
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- Easy to keep sanitary
- Smooth, impermeable surface
- Easy on and off slide-handling
- Scraper blade can be applied directly for discharging or cleaning

Our engineering staff will design a complete unit to fit your job. Belts of carbon or stainless steel . . . any length and a wide range of widths. Special water-bed arrangement can be provided for cooling of materials.

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Manufacturers of Steel-Belt Conveyors For Over 30 Years

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— CUTS COSTS — WRAPS WITH AMAZING HIGH SPEED!

No matter what the product — how solid or fragile — how irregular its shape . . . it becomes a package of eye-appealing beauty when "float" wrapped on the Campbell Wrapper. This continuous feed machine delivers *without breakage* up to 160 single or multiple packaged units per minute, dependent on product. Using wrap materials of all types, it completely heat or glue seals — with crimp or crimp folded ends. Labor saving — only one operator and packer are required in most cases. *Ideal* for most products — *perfect* for prepackaged foods and meats. Write for fully illustrated brochure.

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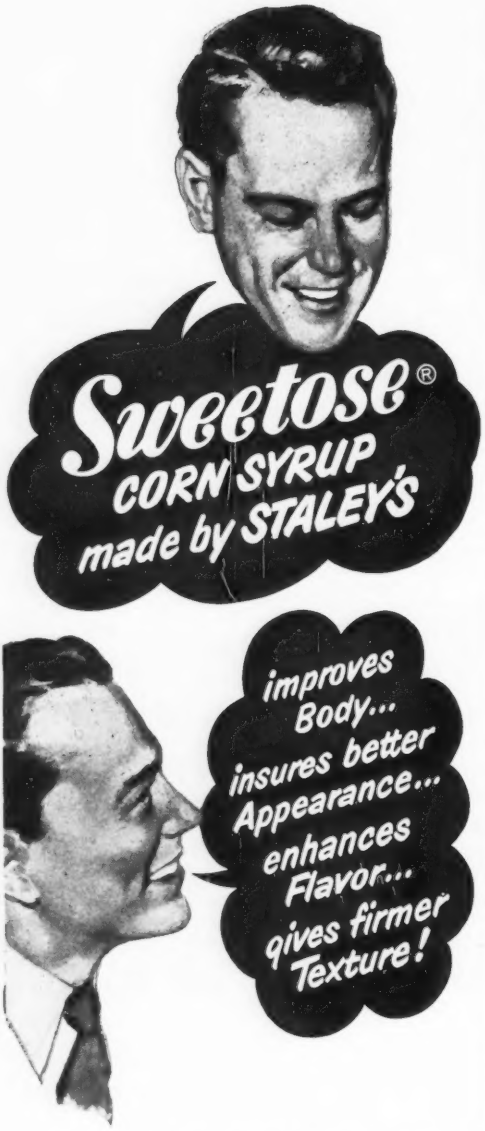
Aniline and Gravure Printers, Folders, Interfolders, Laminators, Waxers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Creepers and Tissue Converting Units.



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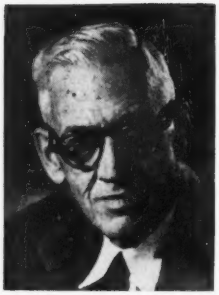


Walter P. Baldwin, director and executive committee member, Peter Paul, Inc., has been appointed assistant to Pres. John H. Tatigian.

succeeding R. T. Mohan, who became chairman of the board.

Walter F. Straub, head of the W. F. Straub Co., Chicago, has been appointed to the staff of the Secretary of Agriculture. He will serve as a consultant on marketing and distribution of foods.

Associated Industry

Allis-Chalmers has assigned C. W. Bloedorn to its Atlanta office as southeastern representative for the company's steam turbine department.

Aluminum Co. of America has named Roy A. Hunt, president since 1928, to chairmanship of the executive committee, while I. W. Wilson, senior vice-president, becomes president. Arthur V. Davies continues as chairman of the board.

Atlas Powder Co. has named J. Peter Kass director of research, succeeding K. R. Brown, who was elected a vice-president. Kenneth E. Mulford was appointed general manager of the company's industrial chemicals department, succeeding J. R. Frorer, who was also elected a vice-president.

American Can Co. recently elected Pres. C. H. Black as chairman of the board, succeeding D. W. Figgis, who is retiring after 50 yr. with the company. W. C. Stolk, executive vice-president, becomes the new president.

American Cyanamid's Calco Chemical Div. has appointed Frederick H. Adams a research associate. He joined Calco in 1933.

Anchor Hocking Glass Corp. has opened the first unit of a new engineering and research center at Lancaster, Ohio. The unit is said to be one of the most modern laboratories in the packaging industry.

Babcock & Wilcox Tube Co. has made four changes in top executive officers. Luke E. Sawyer, former executive vice-president was elected president; Alfred Iddles, former president, became chairman of the board; Isaac Harter, former chairman, was named a consultant to the company, and Edward A. Livingstone, vice-president, was given broad organizational responsibilities.

De Laval Separator Co. has elected C. B. Schmidt president. George W. Smith, who is also president of the De Laval Steam Turbine Co., becomes chairman of the board.

DuPont recently opened its new $30,000,000 experiment station in Wilmington, Del. One of the largest research establishments in American industry, the station will house nearly half the company's research personnel.

Flintkote Co. will start work this month on a $3,000,000 shipping container and folding carton plant in San Leandro, Calif.

Foster Wheeler Corp. has assigned charge of the Carteret, N. J., and Dansville, N. Y., plants to Gerald D. Dodd, assistant to the president. He succeeds William Lonsdale, vice-president, who retired May 1.

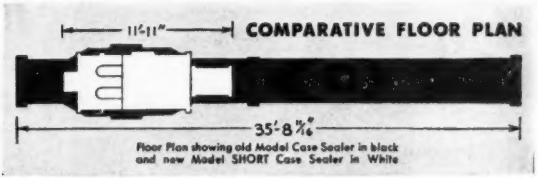
Marathon Corp. has taken over the Oswego, N. Y., properties of St. Regis Paper Co. The purchase includes a Kraft paper plant, multiwall bag plant and a machine shop. Plant and shop equipment were not involved.

Monsanto Chemical Co. has elected Charles Allen Thomas to presidency of the company, succeeding William M. Randy, who is retiring.

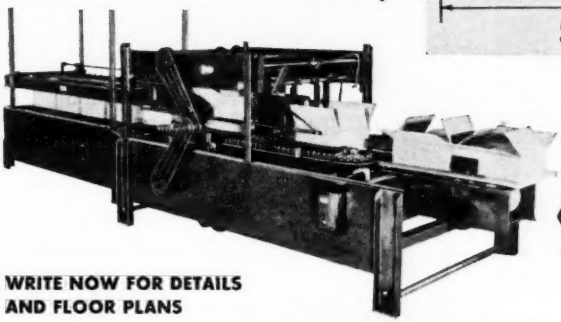
Read Standard Corp. is the new corporate name of the former Standard Stocker Co., Inc., and its Read Machinery Div. The company will operate under two main divisions, Bakery-Chemical and Blower Stocker.

Wyandotte Chemical Co. has announced plans for a $22,000,000 expansion program to be carried out within the next 24 to 36 months. Object of the program is two-fold: (1) To increase output of chlorine, soda ash and caustic soda, and (2) to provide processing facilities for large-scale production of organic detergents and industrial cleaners.

SAVE FLOOR SPACE



Floor Plan showing old Model Case Sealer in black and new Model SHORT Case Sealer in White



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WITH A-B-C SHORT CASE SEALER!

Save two-thirds of your valuable floor space with the A-B-C Short Case Sealer—with increased packaging efficiency, more speed, less expense . . . Automatically glues, folds and seals either or both top and bottom flaps of shipping cases in one operation. Made in eight models to fit any production requirement. Hot air heaters dry the glue in one-half the time. Speeds up to 30 cases per minute.

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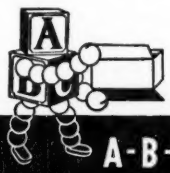

TOP QUALITY CASE HANDLING EQUIPMENT
Whatever your packaging job, A-B-C has a production proved machine for you—case sealers, unloaders and unscramblers, side sealers, and hand gluers.

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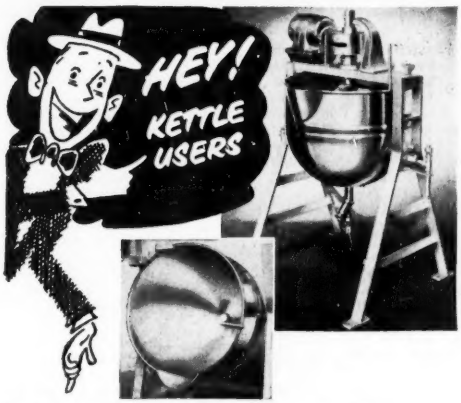
QUINCY, ILLINOIS



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The steam jacket on this Hamilton Tilting Kettle covers ⅔ of kettle area. Fabricated in stainless steel in gauges required by ASME Code or heavier. This kettle is available with single or double motion agitator with maple or nickel alloy scrapers—plus a Hydraulically lifted agitator arm. Any combination available upon specification.

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Here is a filter that's practically "made to order" for the food processor. It's all stainless steel, constructed entirely of plate and bar stock, with NO porous, pitted or rough surfaces. Every part coming in contact with liquid is HIGHLY POLISHED . . . permitting easy and thorough cleaning of the filter, assuring better and more positive filtration. Quickly opened and closed. Flexible for double filtration. No rubber washers. Uses any type filter pad, paper or cloth.

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TYPE LSI

Inexpensive, exacting temperature control combined with continuous indication of the controlled temperature. Control temperature may be changed by turning a thumb screw. Actuates electric heaters, motors or solenoid or motor valves. Catalog No. 1025.

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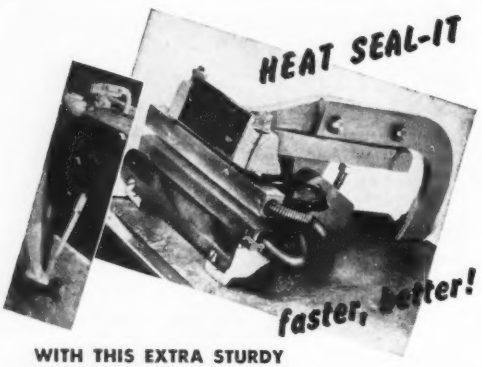

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MODEL 12-F
$79.50

The only Heat Sealer with these features:
(1) **Floating Jaw.** Upper jaw is floated on springs providing permanent perfect alignment.
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The result of 20 years of heat-sealing experience, thousands are already in use all over the world.

Automatic & Foot Sealers; Rotary Heat Sealers; Hand Sealing Irons; Bag Making Machines.

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Recent Inventions

Freshly Killed Meat Tenderized by Enzymic Action During Storage at 68-80 deg. F. for 44-56 hr. in Circulating Sterile Air With Moisture Content in Equilibrium With That of Meat—*W. Reiman and C. L. Arnold, Cincinnati, Ohio, and W. A. Tschirgi, White Sulphur Springs, Mont., to The Kroger Co., Cincinnati.* No. 2,528,079. Oct. 31, 1950.

Sliced Bacon and Like Packaged in Pouches or Bags by Aid of Sanitary Paddle With Blades having Movable Parts—*G. H. Whetzell, Hobart, Ind., to Armour and Company, Chicago.* No. 2,528,463. Oct. 31, 1950.

Food Dehydrated by Freezing and Subjecting to Reduced Vapor Pressure and Controlled Heat in Confined Space—*R. B. Roos, Riverside, Conn., and S. L. Galvin, North Bergen, N. J., to Thomas Lipton, Inc.* No. 2,528,476. Oct. 31, 1950.

Bacon Slices Smoked and Cooked Without Distortion in Shape Preparatory to Packaging and Marketing—*O. C. Johnson, Chicago, to Continental Can Co., Inc., New York.* No. 2,528,832. Nov. 7, 1950.

Confections Conveyed and Bagged by Machine Equipped With Suction Device—*V. Blanchard, Abington, Mass.* No. 2,528,997. Nov. 7, 1950.

Unfermentable Sugars in Vinasse Converted to Fermentable Sugars by Mineral Acid Treatment at 140-160 deg. C. for 15-60 min.—*F. Boinot and Pi. Gautier, Melle, France, to Les Usines de Melle (Societe Anonyme) of Saint-Leger-les-Melle, France.* No. 2,529,131. Nov. 7, 1950.

Aromatized Butter Made by Converting Butterfat in Rich Cream from Dispersed Phase to Continuous Phase by Cooling—*A. L. Stigen to Aktiebolaget Separator, Stockholm, Sweden.* No. 2,529,232. Nov. 7, 1950.

Ground Meat Patties Cooked by Infra-Red Radiation Preparatory to Canning—*J. Hoffman, New York, and A. Gruff, Flushing, to Claridge Food Co., Inc., Murray Hill, N. Y.* No. 2,529,253. Nov. 7, 1950.

Freezing Accelerated by Wrapping Foods in Thin-Walled Aluminum Foil—*C. Hammond, Ashland, and R. E. Jacke, Richmond, Va., to Reynolds Metals Co., Richmond.* No. 2,529,388. Nov. 7, 1950.

Gum Guaiac Treated With H_2O_2 to Prevent Color Formation When Used to Stabilize Fatty Material—*H. C. Black to Swift & Co., Chicago.* No. 2,529,446. Nov. 7, 1950.

Dense, Heavy Protein Curd With Relatively Quick Setting Rate From Water-Peanut Meal Suspension—*J. C. Arthur, Jr., New Orleans, La., to USA.* No. 2,529,477. Nov. 14, 1950.

Vegetables and Similar Foods Packed in Hermetically Sealed Containers Under High Vacuum and Heat-Treated With Agitation to Sterilize With Retention of Color, Flavor, Texture, Nutritive Value, and Vitamins—*H. L. Roberts, Maywood, and P. Sognefest, Broadview, Ill., to American Can Co., New York.* No. 2,529,514. Nov. 14, 1950.

Corn Meal Sterilized During Passage Through Confined Space in Contact With Heated Gas Under Pressure—*A. D. Singh to Institute of Gas Technology, Chicago.* No. 2,529,710. Nov. 14, 1950.

Foods Containing Water Quickly Frozen by Contact With Neutral Liquid Refrigerant at Below 0 deg. C., Subsequently Subjected to Current of Gas at Below 0 C.—*J. Lomholdt-Pedersen, Gentopte, Denmark.* No. 2,529,959. Nov. 14, 1950.

Pineapples Peeled in Machine Equipped With Plurality of Radially Disposed Adjustable Knives Fitted in Ring on Front Portion of Machine and With Rotatable Tubular Peeler in Rear Portion—*E. R. Jagenburg, to E. R. Jagenburg, Inc., Brooklyn, N. Y.* No. 2,530,063. Nov. 14, 1950.

Egg Meats and Like Mixed in Continuous Manner During Passage Through Horizontal Casing Equipped With Removable Agitator—*A. L. Payton to Tranin Egg Products Co., Kansas City, Mo.* No. 2,530,174. Nov. 14, 1950.

Peas and Beans Dry-Heated Sufficiently to Darken Preparatory to Hydration—*L. R. V. Strasburger, Baltimore, Md.* No. 2,530,212. Nov. 14, 1950.

Coats Removed From Cereal Grains by Treating With Oil, Fat, and Wax Extraction Solvent Preliminary to Subjecting to Alkaline Solution Until Coat is Substantially Swelled and Loosened—*W. B. Thrasher, San Antonio, Tex., to Tex-O-Kan Flour Mills Co., Dallas.* No. 2,530,272. Nov. 14, 1950.

Want more information on any of these recent patents? If so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

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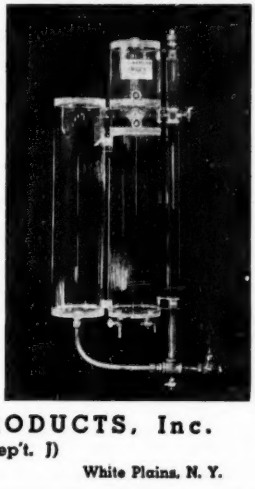

Thanks to simple design and non-corrosive construction the CHLORAMETER eliminates headaches in treating

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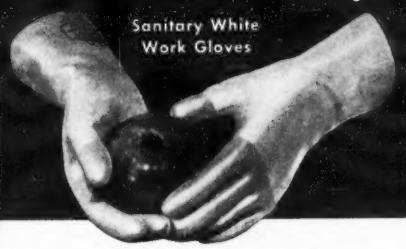

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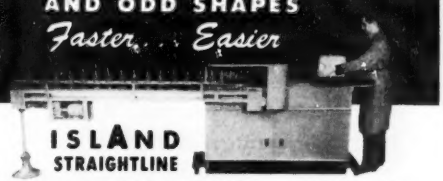

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● Cartons or cases of bottles, jars, or cans dumped on table are instantly unscrambled and regimented into a single file to keep a continuous flow of units on your production line. Reduces labor costs . . . minimizes breakage . . . saves floor space . . . and meets all sanitary specifications as operator does not handle mouths of units.

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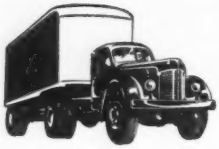

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New Catalogs and Bulletins from manufacturers of equipment and supplies —Free For The Asking—

Food Plant Equipment

Plastic Pipe

Engineering data on pipes, tubing, valves, and fittings of polyethylene plastics are covered in 16-page color catalog. Chemical properties and resistance tables are included.—*American Hard Rubber Co., 11 Mercer St., New York City 13.*

Coolers

Fourteen page color booklet gives description of freon and ammonia coolers of dry expansion type for air conditioning, process, industrial and commercial refrigeration applications. Detailed graphs, data sheets, and log tables appear with text.—*Paterson-Kelly, Inc., East Stroudsburg, Pa.*

Polyphase Motor

Polyphase induction motor and its place in the industrial picture is subject of 28-page Catalog B-4739. Applications for a number of industries are illustrated.—*Westinghouse Electric Corp., Pittsburgh, Pa.*

Fittings

New low-cost corrosion resistant fittings are described in 8-page booklet.—*Horace T. Potts Co., Philadelphia, 34.*

Tubing Steels

Condensed technical information involving design, fabrication, and use of tubing in elevated temperature and high pressure applications is featured in 6-page Technical Bulletin 12F.—*The Babcock & Wilcox Tube Co., Beaver Falls, Pa.*

Dough Kneading Machine

Detailed description of high speed dough mixing and kneading machine with capacities, dimensions, floor loads, etc. is set forth in table form in 6-page folder.—*American Machine & Foundry Co., 485 Fifth Ave., New York 17.*

Swivel Joint

Data on newly-developed 90-deg-swivel joint for use with steam, water, oil, chemicals and gas is illustrated and diagrammed in bulletin.—*Phillips Rotary Joint Valve Co., Inc., West New York, N. J.*

Cast Monel

Information concerning production of cast monel, and the range of desirable physical and mechanical properties obtainable are presented in 8-page booklet. Monel's use in handling of acids and alkalis, also its machinability and weldability characteristics, are discussed.—*Cooper Alloy Foundry Co., Hillside, N. J.*

Complete Packing Line

Complete carton set-up, loading and sealing, and case gluing and sealing on automatic packaging lines are described in 4-page Folder 100-47.—*J. L. Ferguson Co., Joliet, Ill.*

Automatic Filler and Conveyor

Whiz-Packer combination of filling machine and conveyor is set forth in bulletin.—*Frazier & Son, 338 Cortland St., Belleville 9, N. J.*

Rotary Pumps

Pictured and sketched in 6-page Bulletin 307 are rotary pumps with capacities from 5 to 1,500 gpm. Included are maintenance tips.—*Blackmer Pump Co., 1809 Century Ave., Grand Rapids 9, Mich.*

Induction Motors

Large 2-pole squirrel cage induction motors are illustrated in 6-page Bulletin O5B7550. They are rated from 900 hp. on up.—*Allis-Chalmers Mfg. Co., Milwaukee 1.*

Pasteurizer-Coolers

Typical installations are pictured and construction details are revealed on batch pasteurizer-coolers in 8-page Bulletin 52. Capacities range from 100 to 1,000 gal.—*Jensen Machinery Co., 110 N. Franklin St., Chicago.*

Chrome Plating Unit

New industrial hard-chrome plating unit is detailed in 4-page leaflet. Advantages discussed are built-in power, low power consumption, easy operation and low cost.—*Wood Leonard Electric Corp., Mt. Vernon, N. Y.*

Intrusion Alarm

Photoelectric intrusion alarm described in Bulletin TI-511 is said to provide positive burglary protection for various offices and industrial properties. An invisible infra-red beam crossing any space up to 50 feet centers on control eye which actuates alarm if beam is interrupted.—*Photoswitch, Inc., Cambridge 42, Mass.*

Filler

Fifteen-ton station filler for tea, beans, whole grain corn, and similar easy-flowing products packed

in sauce or brine, is described and illustrated in *FME Facts*, Vol. 4, No. 4.—*Food Machinery & Chemical Corp., Hoopeston, Ill.*

Stainless Tubes and Pipes

Uses and fabrication of stainless steel tubing are listed with photos, detailed diagrams, and charts. Leather-bound 104-page booklet is designed to serve as a guide in choosing proper materials.—*Babcock & Wilcox Tube Co., Beaver Falls, Pa.*

Combustion Equipment

Oil and gas burners, atomizers, pump sets and boilers are covered in 8-page diagrammed and illustrated catalog.—*Enco Combustion Equipment, New York 6.*

Carbon Dioxide Weighers

Bulletin features new device for weighing CO_2 cylinders without necessitating removal of system from service. Has weighing capacity of 200 lb.—*American-La-France Corp., Elmira, N. Y.*

Control Equipment

Metal Detector

Four-page leaflet depicts automatic inspection equipment designed to detect metal of any kind in non-metallic materials, such as food. Product is screened by high-frequency electro-magnetic field.—*Radio Corp. of America, Camden, N. J.*

Depth Gage

An instrument for measuring tank contents regardless of where tank may be located is subject of 8-page well illustrated catalog. Gage may be applied in measurement of oil, water, gasoline, oil solvents, beverages, and other liquids.—*Uehling Instrument Co., Paterson, N. J.*

Level Recorder

Static pressure and differential pressure type indicators and recorders are diagrammed in 4-page leaflet. Applications and operating ranges are included.—*Bailey Meter Co., Cleveland 10.*

Resistance Thermometer

Electronic resistance thermometer for mobile or other classes of severe service where vibration and motion exclude many types of instruments is detailed in illustrated and diagrammed booklet.—*Bailey Meter Co., Cleveland 10.*

Synchronous Motor Controls

Polarized field frequency controls (interrupting capacity type) for synchronous motors are detailed in 8-page Bulletin 3100-PRD-204. They are for full-voltage, reduced-voltage, and part-winding starting.—*The Electric Machinery Mfg. Co., Minneapolis.*

Telemeter

Bulletin DM029 contains information on use of Telemeter for remote measurement and automatic control of variables over distances.—*Bristol Co., Waterbury, Conn.*

Electronic Apparatus

Nineteen-page catalog lists laboratory electronic measuring apparatus, including pH meters, spectrophotometers, and colorimeters. Detailed and pertinent illustrations, tables and diagrams appear.—*E. Machlett & Son, 220 E. 23rd St., New York 10.*

Load-Cell Recorders

All-electric method for continuously measuring and recording thrust, load, torque, weight, and fluid pressure in machine testing is discussed in 4-page folder.—*Leeds & Northrup Co., Philadelphia 44.*

Materials Handling

Industrial Sweepers, Trucks

Electric powered sweepers for indoor or outdoor operation, fork-lift trucks, and cargo handlers are detailed and pictured in colorful 12-page booklet.—*Exide Co., Philadelphia 32.*

Trucks, Tractors

Report titled *Job Study* shows how Columbus Auto Parts Co. saved 160 man-hours per week in handling and transporting materials within its plant. Loading costs were reduced and warehouse capacity was tripled. Listed as *Certified Job Study No. 102.*—*Towmotor Corp., Cleveland 10.*

Conveyors

Slat, scraper, drag, vertical, pusher, and extended pin type conveyors are treated in booklet designed to suit the particular needs of individual industries.—*Chain Belt Co., Milwaukee.*

Wire Ropes, Slings

Detailed information on wire rope, slings, and getting maximum rope service with greatest safety on cranes is presented in illustrated 2-page leaflet.—*Macwhyte Co., Kenosha, Wis.*

Tractors

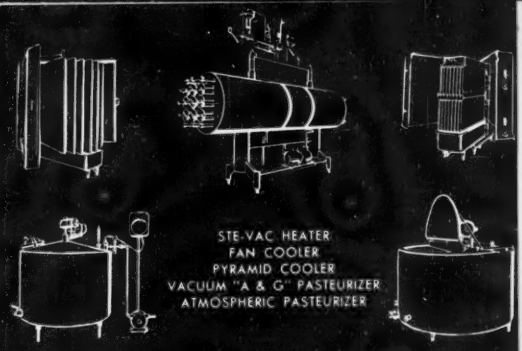
Sixteen-page catalog gives a picture survey of tractor uses throughout the world.—*Caterpillar Tractor Co., Peoria, Ill.*

Conveyor Belts

All types of conveyor belts are discussed and portrayed in new, loose-leaf, 3-ring catalog. Types of belt available, proper belt for your application, and lists of sizes and prices are given.—*Buffalo Weaving & Belting Co., Buffalo.*

Truck Operation

Case histories on individual GMC trucks and fleets show how



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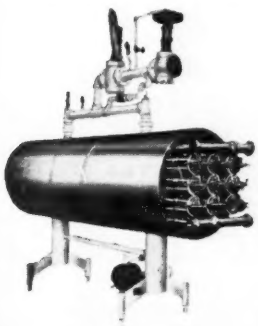
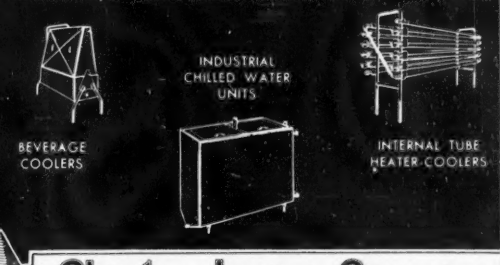
Full specifications and illustrated bulletins gladly furnished on request.



The STE-VAC HEATER



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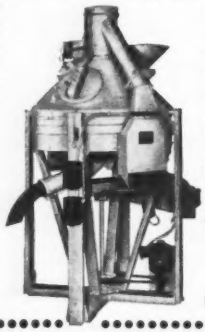
Whatever dry food materials or products you are processing, you can probably clean and classify them with the new Model Bauer No. 208-2 Specific Gravity Separators.

The model illustrated (No. 208-2AA) is used for cleaning shelled peanuts, shelled corn, coffee, and oil-bearing seeds. It's one of seven standard models—and we also build special models to meet special situations.



Our Bulletin F-16 gives detailed information on these machines and their installation. It also offers you our laboratory service to show what can be done with a test run of your particular materials.

Ask for a copy of the bulletin now while the subject is on your mind.

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low operating costs have been attained. First brochure of series goes into operation of GMC Model HBG-745 diesel tractor.—*GMC Truck & Coach Div., General Motors Corp., Pontiac 11, Mich.*

Trailers

Featured in 62-page 8-color catalog are 29 basic trailer models. Advantages and best uses of each of 6 types of trailer landing gear, weight savings of aluminum wheels and supports, and most suitable couples for a wide variety of hauling needs, are outlined.—*Zimmer-Keller, Inc., Detroit 26.*

RR Car Mover

New savings and technics for job of spotting, switching, or hauling railway cars are covered in illustrated brochure. Trackmobile (6000 lb.) develops a drawbar pull of 7350 lb. through ingenious use of hydraulic jacking.—*Waldie & Briggs, Inc., Chicago 1.*

Fork-Lift Trucks

Lift truck users faced with unusually difficult handling problems should benefit from colorful 4-page folder describing and illustrating devices designed to grip, clamp, grab, support and transport almost any type of load.—*Towmotor Corp., Cleveland 10.*

Plant Supplies

Control Coatings

Description and applications of machinery enamels, damp wall enamels, cement floor finishes, and stucco-masonry coatings are covered in colorful 8-page catalog.—*Casey & Case Co., Maywood, Calif.*

Load Cells

Specifications for new line of 7-U-1 SR-4 universal load cells ranging in weighing capacity from 500 to 50,000 lb. in tension and compression are presented in 2-page Bulletin 324. — *Baldwin Lima-Hamilton Corp., Philadelphia 42.*

Xerography

A dry, electrical, direct positive process for copying anything written, printed or drawn is discussed in 6-page brochure. Savings of space, time, money and materials are reported advantages of newly-developed unit.—*Haloid Co., Rochester 3, N. Y.*

Walk-In Coolers

Coolers of stainless steel or aluminum bonded to plywood are described in 4-page folder. Panel construction permits low-cost installation according to any specification or floor plan.—*Freezer Box Division, Annapolis Yacht Yard, Inc., Annapolis, Md.*

Vacuum Breakers

Two-page Specification Sheet 413 details vacuum breakers for use on water towers, tanks, or other closed vessels and lines from which fluid may be rapidly drained. Standard sizes range from ¼ to 3 in.—*Industrial Div., Minneapolis-Honeywell Regulator Co., Philadelphia 44.*

Roller Chain, Sprocket

Complete specifications and engineering-reference tables on standard roller chains, sprockets and attachments are provided in detailed folder.—*Whitney Chain Co., Hartford, Conn.*

Miscellaneous

Standardization

Importance of standardization in national defense, company operations, procurement, construction, and safety is emphasized in new booklet sponsored by American Standards Assn.—*American Standards Assn., 70 E. 45th St., New York 17.*

Prepackaging Tips

Pamphlet presents three phases of storage to show case operation: Processing, packaging and displaying. G-shapes, layout of packaging areas, wrapping technics, and elements of effective display are discussed.—*Sylvania Division, American Viscose Corp., 350 Fifth Ave., New York 1.*

Vanilla Evaluation

A 20-page report on vanilla flavoring tests, covering the latest scientific method (organoleptic profiles) includes diagram that makes flavor results easy to grasp.—*Aromanilla Co., Inc., 6 Varick St., New York 13.*

Story of Refrigerants

Development, manufacture, properties and uses of Freon refrigerants and propellants are presented in 40-page, well-illustrated booklet.—*E. I. duPont de Nemours & Co., Kinetic Chemicals Div., Wilmington 98, Del.*

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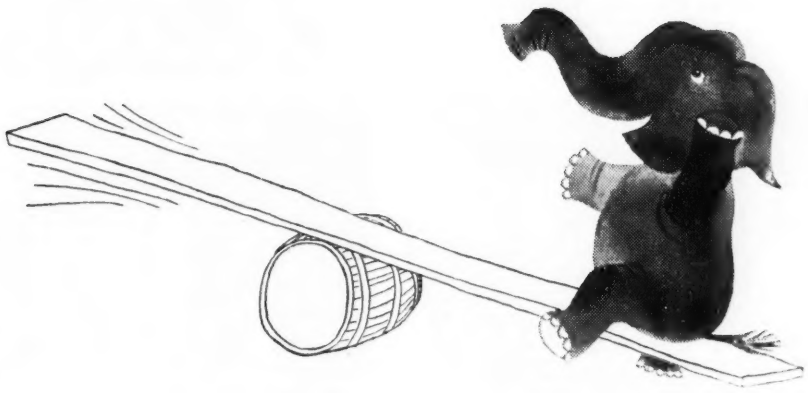

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Use Wyandotte Better Blend Soda as a leavening agent in self-rising flours and baking powders. Use it for effervescence in mineral waters and soft drinks. Use it, too, for preservatives, disinfectants and neutralizers.

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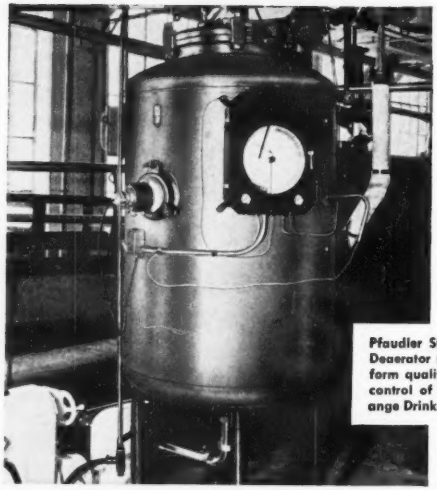
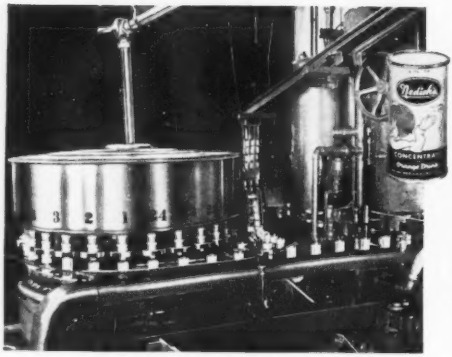
How Pfaudler Equipment Aids Nedicks

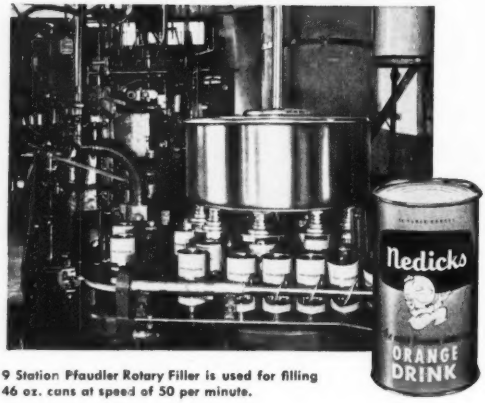
to process quality orange drink



Pfaudler Stainless Steel Deaerator is key to uniform quality and flavor control of Nedick's Orange Drink.



24 Station Pfaudler Rotary Filler where 6 oz. cans are filled at a rate up to 400 per minute.



9 Station Pfaudler Rotary Filler is used for filling 46 oz. cans at speed of 50 per minute.

Nedick's is a famous name in orange drinks, and by producing a *uniformly* good quality of orange concentrate, demand has increased phenomenally. How do they do it? The answer—fast processing!

This orange product, like all citrus juices, is quick to oxidize. Nobody wants your product after that. With the aid of a Pfaudler deaerator in combination with Pfaudler High-Speed Rotary Fillers, Nedick's has solved the problem of oxidation.

The deaerator removes the air which is so detrimental to flavor and keeping quality, just before the product is canned. A constant vacuum is maintained as juice flows through the unit. According to Mr. E. S. Hansen, Production Manager of Nedick's, ". . . tests for residual air content in the product demonstrate efficient deaeration." Result—good flavor.

Speed of handling is also essential—the reason why Nedick's uses one 9 Station Pfaudler Filler for handling 46 oz. cans and one 24 station machine for filling 6 oz. cans. These machines are noted for their speed as well as their accurate and clean fill. When you can pack as good a product as Nedick's Orange Drink base day after day, isn't it good proof of the profitability of using Pfaudler equipment and process know-how?

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DONALD K. TRESSLER & ASSOC.
Food Technologists and Engineers
Specialists in Food Preparation and preservation; Equipment Testing and Evaluation; Food Freezing; By-Product Utilization; Manufacture of Pure Fruit Flavors.
North Compo Road Westport, Conn.

STRASBURGER & SIEGEL
Chemists — Bacteriologists — Food Technologists
Specialists in Canned and Glassed Foods
Laboratory Services
Testing Tomato Products, Mayonnaise, Pickles, Oils, Fats, Beverages, Sugars, Filth in Foods, Food and Drug Labels, Expert Testimony
1403 Eutaw Place Baltimore 17, Maryland

GRIFFIN & SELBY
Consultants to the Food Industries
Manufacturing, Engineering, Management, Marketing Studies for
Increased Production and Sales
Modernization of Plant and Equipment
Profit and Product Improvement
285 Madison Avenue, New York 17, New York
Telephone MUrray Hill 5-8032

GUSTAVE T. REICH
Consulting Chemical Engineer
Continuous Processes Sugar
Complete Plants Yeast, Molasses
Alcohol - Dry Ice - Waste
1422 Chestnut St. Philadelphia 2, Pa.

JOHN I. THOMPSON & CO.
Consulting Engineers to the Food Industries
Mechanical Management and Process Engineering. Investigation and Reports. Plant Layout and Design. Methods and Procedures.
312-17th St., N. W. Washington, D. C.

If
there is anything
you want . . .
that other readers of this paper can supply
or—
something
you don't want
that other readers can use, advertise it in the
SEARCHLIGHT SECTION

INGREDIENTS for the FOOD PROCESSOR

CINNAMON - PEPPER - SPICES
Import, Grinding, Wholesale for the Bakery, Meat Packing, Institutional Trade
Atlantic Processing Mills Corp.
6-8 Fletcher Street New York 7, N. Y.

New Advertisements
received by June 21st will appear in the July issue subject to limitation of space available. Address copy to the
FOOD INDUSTRIES
330 W. 42nd St., New York 18, N. Y.

CARROT OIL makes foods golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.
Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET
New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!
NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

$1.20 a Line—Minimum 3 Lines.

To figure advance payment count 5 average words as a line.

EMPLOYMENT WANTED & INDIVIDUAL SELLING OPPORTUNITY undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.20 a line an insertion.

INFORMATION:

BOX NUMBERS count as one additional line.

DISCOUNT of 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

DISPLAYED RATE:

The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. F.I.

NEW ADVERTISEMENTS received by 10 A. M. June 21st at the New York Office, 330 W. 42 St., New York 18, N. Y., will appear in the July issue subject to limitations of space available

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

CHEMICAL ENGINEER: Large national firm in cereal field needs graduate chemical engineer with experience in food processing. Location in Minneapolis. Please state education and experience fully. P-9472, Food Engineering.

FROZEN FOOD Technician: Able to demonstrate for seafood packers, conventions, etc. Must travel Eastern U. S. Accepted product—established company expanding. Full details, salary, experience, education in first letter. Interview conveniently arranged. P-9782, Food Engineering.

WANTED: ASSISTANT Director for Fishing Industry Research Institute with University qualifications in Chemistry and/or Microbiology plus knowledge of the food industry and experience of research in the preservation, processing and transport of food, preferably fish, including the storage of fresh and frozen products, canning, salting, drying, smoking and by-products generally. Salary will be between $1250 and $1750 depending on qualifications and experience. Cost of transport of successful candidate and family to South Africa will be paid. A provident fund on a 7% contributory basis is in existence. Applications to be forwarded to Fishing Industry Research Institute, Cape Town, South Africa, before 30 September 1951, giving full particulars of qualifications and experience.

EMPLOYMENT SERVICE

SALARIED PERSONNEL $3,000-$25,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

HIGH TYPE executive experienced all phases food industry, seeks position where quality production coupled with judgment and drive required. PW-9929, Food Engineering.

PLANT MANAGER: 22 years experience, Plant lay-out, Purchasing, Costs, Quality control, Manufacture, and Sale of Canned Fruits, Vegetables, Meats, Poultry, Jams, Jellies, Mayonnaise, Syrups, Extracts, etc. Extensive experience on Army Contracts. Available June 15th PW-9718, Food Engineering.

SPECIAL SERVICE

Photomicrographs

made to your requirements. Modern equipment. Prompt service. Samples on request. Fred Schmidt, Bedford Hills, N. Y.

PATENTS

Consult: Z. H. Polachek,

Reg. Patent Attorney, 1234 Broadway, New York 1, N. Y.

FOOD CHEMISTS
JR. AND SENIOR

Research Ph.D.—Chocolate $7,200
Food Technologist—Ice Cream 6,000
Tech'l Director—Cereals 7,500
"Many Jr. Positions"
Call, write or wire:—Gladys Hunting (Consultant)
DRAKE PERSONNEL
7 W. Madison St. Chicago 2, Ill.

COURSES IN FOOD TECHNOLOGY

a. Mathematics and Chemistry of Food Technology
b. Food Analysis
c. Nutrition
d. Canning
e. Freezing
f. Preserving
g. Inspection and Grading according to USDA standards
h. Mold Counting and Insect Examination

RESTAURANT MANAGEMENT
GENERAL STUDY OF COOKING
PREPARATION OF SALADS
PIE AND PASTRY MAKING
CAKE DECORATING
STUDY OF MEATS

MEN OR WOMEN
VETERANS OR NON-VETERANS
DAY AND NIGHT CLASSES

Highly qualified instructors with practical experience as well as European and American degrees in their respective fields.

ATTENTION EMPLOYERS

If you need qualified personnel, such as: Food Technologists, Laboratory Technicians, Mold Counters, Foremen, Forelaides, Graders and other trained personnel for Quality Control Work, please contact the Employment Office of the school.

MIAMI SCHOOL FOR FOOD PROCESSING SPECIALISTS
Box 383 CORAL GABLES 34, FLORIDA
Telephone: 83-1301

AVAILABLE
Manufacturing Licenses

French Manufacturer owning patents relating to atomizers and treating apparatuses for milk, food and chemical industries, already employed with success in France, is desirous of assigning manufacturing licenses in the United States.
Write to P. R. Laguilharre, 6, Rue Robin, ENGHIEN-LES-BAINS (Seine et Oise) France.

—DRYING SERVICE—

Well equipped food plant in N. J. metropolitan area has drum drying space available for additional work on contract basis. Particularly well equipped to handle sugar syrups of any type or hygroscopic materials.

FS-9703, Food Engineering
330 W. 42 St., New York 18, N. Y.

FOOD PLANT WANTED

We are now manufacturing over $20,000,000 in various lines and wish to expand by acquisition of assets or stock of one of more industrial companies. In our negotiations the sellers' problems and wishes will receive full consideration. Present personnel will normally be retained.

Address all replies
"Confidential" C. J. GALE, Sec.
233 Broadway, N. Y. 7, N. Y. BA 2-1819

BOUGHT—SOLD

Citric - Tartaric - Phosphoric Acids
Vanillin, Coumarin, Glycols, Ethanolamines, Glycerine, Other Materials.

Chemical Service Corporation
88-10 Beaver St. New York 5, N. Y.

FOR SALE
One (1) RDH12 Disintegrator

Purchased 1946 and used 4 years. In top condition. Has 30 HP 3600 RPM Motor. Complete with spare unused Westinghouse 30 HP 3600 RPM motor—$1,675 FOB Lexington, Kentucky, or $1,250 without spare motor.

W. T. YOUNG FOODS, INC.
767 E. Third St. Lexington, Ky.

SALE

2 U. S. Bacon Slicers—Model No. 3 ..$1600.00 each
1 U. S. Bacon Slicer—Model No. 3 .. 2000.00
1 Bacon Conveyor Table 13'9" x 3'8"
S. S. Top with 12" S. S. Motor
Driven Belt 700.00
Can be inspected in Philadelphia.
Offered as is, where is, subject to prior sale.
FS-9670, Food Engineering
330 W. 42 St., New York 18, N. Y.

An Investment!

Productive advertising is an INVESTMENT rather than an EXPENDITURE.

"Searchlight" advertisers almost invariably report prompt and satisfactory results.

BE CONVINCED — send us your advertisement TODAY.

Address
Classified Advertising Division

FOOD ENGINEERING

330 W. 42nd St., N. Y. 18, N. Y.

LIQUIDATING
AT TERRIFIC PRICE REDUCTIONS

UNION Rebuilt Machinery Established 1912

The Ultra Modern Hard Candy and Mint Roll Manufacturing and Packaging Equipment

formerly used to produce "Trolls" and "Hollywood Stars" of California Pressed Mints and also Hard Candy Discs

This equipment is excellent for use in the production of medicated candy, cough drops and candy containing antibiotics

PARTIAL LIST OF EQUIPMENT AVAILABLE

R. A. JONES CONSTANT MOTION CARTONERS (New 1945). With counter and assembler for tablets or discs or any other product. Capacity—120 to 140 cartons per minute.
PACKAGE MACHINERY CO. FA2Q CELLOPHANE AND WAX WRAPPER.
PACKAGE MACHINERY CO. CA2 BOX WRAPPERS (New 1946). With electric eye, wax application unit, tear tape attachment, continuous chain feed and heat-sealing units. Adjustable. Speed to 140 per minute.
TOWNSEND ROLL WRAPPERS WITH AUTOMATIC FEEDERS. Have automatic hoppers that assemble individual pieces, wraps them with glassine and with wax paper. Capacity—60 rolls per minute.
MINT ROLL WRAPPERS, COMPLETE WITH MOTORS AND HOPPERS.
BAKER PERKINS PLASTIC HARD CANDY TABLET FORMING MACHINES with 3-way cooling conveyor and sorter. Capacity—up to 2,000 pieces per minute.
MIKRO 4TH, 2TH, 1SH PULVERIZERS.
COLTON ROTARY TABLET PRESSES.
COLTON WET GRANULATOR.
STOKES DRUG MILLS.
DRY POWDER MIXERS.

SAMPLES OF PACKAGES AVAILABLE UPON REQUEST

Inspection at Our NEW YORK SHOWROOMS and at our CHICAGO SHOWROOMS at 167 North May St.
THIS IS YOUR CHANCE OF A LIFETIME TO SECURE THIS MOST DESIRABLE EQUIPMENT AT REAL BARGAIN PRICES

Immediate Deliveries
Write, Wire, Phone Collect For Complete Details and Prices

Act Now
Tell Us Your Packaging and Wrapping Needs and Send Us Samples of Your Product. Our Engineers Will Assist You.

Union STANDARD EQUIPMENT CO.
318-322 LAFAYETTE ST., NEW YORK 12, N.Y.

---

55 CYPRESS TANKS

Approximately 3200 gal. cap. each, 9' dia. by 8', with four 4"x6" molded end pieces, 12"x17" manhole, with iron inward swinging cover, eight ⅞" galvanized steel hoops, and patent tightening lug, four bell base screw jack floor stands, pitched interior, shellacked and painted exterior, like new, replacement cost today according to manufacturer $1000 each; we offer immediate delivery at considerably less than half of new, still erected and inspection invited at

GRUNEWALD BREWERY
AMERICAN ST. & SUSQUEHANNA AVE.
PHILADELPHIA, PA.

FOR SALE
THREE (3) BAUER NO. 303 PEANUT BUTTER MILLS

Purchased in 1946; used four years until replaced by larger Bauer units. $500 each FOB Lexington, Kentucky, complete with 10 HP heavy duty motors and starters.

W. T. YOUNG FOODS, INC.
767 E. Third St. Lexington, Ky.

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO
PHILADELPHIA, PA
3 WAREHOUSES
Proper Temperature for Frozen Foods

OUR BULLETIN A-27 *Just Out,*

LISTS OVER 300 DESIRABLE ITEMS

Write for Your Copy

Specials

6—Stainless Steel 950 and 2,700 gallon Jacketed Tanks with Agitators.
1—Pfaudler 500 gal. Glass Lined Reactor.
1—Stainless Steel 18" Bubble Cap Column.
1—Stainless Steel 6' Spray Dryer.
1—Shriver 42" Cast Iron Plate & Frame Filter Press.
1—Flaker 4' x 9' Motor Drive.
1—Stainless Steel Autoclave 75 gals. 500# int. pressure.
1—W. & P. 100 gal. Double Arm Stainless Steel Mixer.
1—Buflovak 6' Vacuum Crystallizer.

We Buy Complete Plants or Individual Pieces.

The Machinery and Equipment Corp.
533 West Broadway
New York 12, N. Y. GRamercy 5-6680

FOR SALE
100 qt. 6 speed Read Vertical Mixer
80 qt. 4 speed Hobart Vertical Mixer
No. 76 Enterprise Food Grinder, belt drive
Burns Peanut Roasters and Blanchers
No. 6 Royal Roaster, 75 lb. capacity
125, 200 and 250 lb. Nut Fryers
250 gallon Copper Steam Jacketed Kettle
SAVAGE BROS. CO.
2638 Gladys Ave. Chicago 12, Ill.

FOR SALE—MODERN PACKAGING EQUIPMENT

LATE MODEL
PNEUMATIC SCALE CO. 35 Per Minute.
AUTOMATIC CARTONING LINE
Automatic Feeder, Bottom Sealer, Liner, Filler, Top Sealer & Compression Unit.

PNEUMATIC High Speed Feeder & Bottom Sealer
PNEUMATIC SCALE CO. Medium size, Double Package Makers
PNEUMATIC 20 spout automatic Vacuum Filler
PNEUMATIC SCALE CO. Tightwraps
PNEUMATIC SCALE CO. Inner Liners, large & small sizes
PNEUMATIC 4 scale Net Weight Filler
PNEUMATIC Automatic 4 Head Capper
PNEUMATIC Single Head Automatic Capper
PNEUMATIC Air Bottle Cleaner
CAPEM 4 Head Automatic Capper
REBINA Automatic Cappers, 1 and 2 Head
FILLER MACHINE CO. 2 and 4 spout Stainless Steel Piston Fillers
LEHMAN Automatic Bag Filler
TRIANGLE 2 station Elec-Tri-Pak Filler Model G2C with feed hopper, stainless steel
KARL KIEFER Rotary Vacuum Filler, 12 spout stainless steel
PNEUMATIC SCALE CO. Simplex Labeler
PACKOMATIC Cartoning Unit, 8" and 12" sizes. Bottom Sealer, Filler and Top Sealer
STOKES & SMITH Model G Auger Fillers
DRIVER 2 Scale Net Weight Filler
CECO 12" Adjustable Top & Bottom Carton Sealer
STANDARD-KNAPP 429 Top & Bottom Case Sealer
FRED GROAT Check Weighers
WORLD fully automatic Straightaway Labelers
WORLD Automatic Rotary Labeler
STANDARD-KNAPP, BURT Can Labelers
NATIONAL, WORLD, ERMOLD Spot Labelers
POWDER MIXERS & SIFTERS 200 to 1000 lbs.
PROCTOR & SCHWARTZ 14 Tray Shelf Dryer
COLTON Tablet Machines, Model 31FT
LEHMAN 12"x24" 3 Roller Granite Mill

WANTED
Single Machine or Entire Plants

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone: Yonkers 5-0442

GET
WEEKS AHEAD
ON
PRODUCTION
By Getting

"CONSOLIDATED"

MACHINERY

1—H.P.M. Co. 300 Ton Curb Press, 24"x36" curb, with steam pump.
1—Mechanical 5'x16' jacketed Cooker or Dryer.
1—Dopp 800 gal. closed jacketed agitated Kettle.
3—Steel 9500 gal. closed jacketed agitated Kettles.
2—400 gal. open s/s jacketed Kettles, 100# jacket pressure.
3—42" All Stainless Steel Centrifugals, Amer. T.&M. Co., each with s/s basket, curb, casing, shaft, unloader and 40 H.P. variable speed Slip Ring 3/60/440 v. 1200 rpm. motor with full controls. Suspended bottom discharge type. Now at Newark.
1—6'x50' Louisville welded shell Rotary Steam Tube Dryer, 2 rows, 54 tubes.
8—Oliver Vacuum Filters, incl. 8x12', 11'6x14', 11'6x18'.
1—8'x12' All Stainless Steel Feinc Rotary Continuous Vacuum Filter, string discharge, with blankets and Stainless Steel trough, repulper, receivers, vacuum pump, motors, reducers, etc. Shop #387.
1—4'x30' Stainless Steel lined Rotary Dryer, with reducer and 10 H.P. motor.
1—18"x28" Bird Continuous Centrifugal Stainless Steel, copper housing, with 10 H.P. motor.
4—Swenson-Walker Jacketed Crystallizers in 10' sections, (1—70' lo. and 3—80' lo. each with pulley driven gear reducer and 10 H.P. A.C. motor). Units are 24" I.D. x 26" high with ⅜" thick steel plate and ¼" steel jackets, steel covers and ribbon agitators.
2—Rotex Sifters, 40x84"; #11 20x48"; also Day #71 Stainless Steel "Roball" Sifters, single deck, 40"x84, m.d. with 2 HP. 3/60/220 volt motors.
2—Mikro Pulverizers, #1 with 7½ H.P. motor and #2 Type 2W at Newark.
15—Mixing Tanks; 15"x10'8", 12'x8'6", 10'x7', 10'x8' with steam coils and agitators; 6x5', 7x7' with agitators.
1—30"x30" Aluminum Filter Press; 45 chambers; 1" cake, side feed, open delivery, non-washing. Used on pectin.

ONLY A PARTIAL LIST

THE KEY TO SAVING TIME AND MONEY
PRODUCTS COMPANY, INC.
13-17 Park Row New York 7, N. Y.

We buy your idle machinery

FOR SALE

70—Stainless Steel and Stainless Clad Jacketed Kettles, 25, 30, 40, 60, 80, 100, 150, 200 gal.
30—Stainless Steel Tanks, 15 gal. to 500 gal.
1—100-gal. T347 Stainless Steel Pressure Tank, 250# Pr., Elec. heated.
9—Aluminum Tanks, closed, 745 gal. to 1485 gal.
15—Horizontal Glass Lined Steel Sectional Brewery Tanks, 7500 gal. & 8250 gal.
14—Wood Tanks 4500 to 6000 gal.
2—Stainless Pasteurizer Vats or Coil Tanks, 10'L x 57"W x 57"H.
6—Powder Mixers, 50#, 200#, 400#, 600#, 2400#.
3—Mikro Pulverizers, Stainless Bantam, #1-F, #2-SI.
2—Fitzpatrick Comminuting Machines, Stainless Steel, "D" & "K".
4—Selectro Stainless Steel Vibrating Screens, two-deck, 2' x 7', enclosed.
10—Rotary Pellet Presses, Stokes D-3 & D-4; Kux model 25.
4—Indiana model "A" Pulpers.
2—Triangle G-2-C Elec-Tri-Pak Weighers & Fillers.
1—Elgin Auto. Twin Piston Filler, Stainless; Agit. hopper.
1—Elgin Auto. Twin Piston Filler, Monel; with 63-mm Capper. New.
1—Horix 18-spout Rotary Auto. Gravity Filler, Stainless.
2—Mojonnier #90 Rotary Vacuum Fillers, 14-spout; stainless.
10—Filter Presses, 10" to 42".
2—Sweetland Filters, #2 & #5.
4—Valley Rotating Leaf Pressure Filters, type 49 RS, 41 lvs. 44½" OD on 3" centers.
3—Copper Beer Still Columns with condensers, etc. 18" dia, 24" dia, 30" dia.
6—Copper Bubble Cap Columns, 18" dia to 48" dia.
6—Aluminum Columns, bubble cap, etc.—24", 27" & 36" dia.

LIQUIDATING
FORMER ALCOHOL PLANT

Capacity 1200 WG 190-proof alcohol per day.

Write for list.

PERRY
EQUIPMENT CORP.
1511 W. THOMPSON ST. • PHILA 21 PA

FOR SALE

Tanks: Stainless Steel, 5 gallon to 500 gallon.
Viscolizers: 200 gal. Union stain. steel.
Powder Mixers: 100 to 2000 lb. capacities.
Tanks: Pfaudler 200 gal. glass lined, open top.
Screens: Rotex #11, 20, 42, Roball #32.
Colloid Mill: Charlotte M-15, stain. steel.
Kettles: Stain. Steel, all sizes, new and used.
Kettle: 60 gal. stain. steel, agitated.
Powder Fillers: Stokes & Smith, Stokes, Triangle, Gump, McMinn, Howes, Day.
Grinder: Gump Bar-Nun, 20 hp. motor.
Fillers: Geyer, Kiefer Visco, M&S., Elgin.
Dicer: Sterling with 1 hp. motor.
Labelers: New Jersey, World, Knapp, Burt, Ermold.
Dough Mixers: 1-6 bbl., single, double arm.
Capper: Pneumatic Scale 2-head automatic.
Vacuum Pan: 50 gal. copper jacketed.

Send us a list of your idle equipment.

LOEB EQUIPMENT SUPPLY CO.
1931 W. North Ave. Chicago 22, Ill.

Charles S. JACOBOWITZ Co.

FOR SALE!

New, never used dbl drum yeast dryer, cap. 375 lbs. wet yeast/hr., with flaker, conveyors, trap, gauges, extra knives, 60 cy., 220/3-phase AC motor, in original crates—immed. delivery.

MRM 12-spt. rotary vacuum filler, stainless contact pts., used only 3 mos.

100 Pfaudler glass enamel lined tanks, immed. del., 4000-15,000 gal. cap.

Tell us your requirements. Tell us what surplus equipment you would like to dispose of. Let us assist you.

Serving American Industry for over 25 Years

FOR SALE

Plate Heat Exchanger, 58 S.S. Plates.
100 gal. S.S. Clad Jkt. Kettles, 30" x 52".
100 to 500 gal. S.S. Mix Tanks, water jkt.
350 gal. S.S. Tank 53" x 36" with coil.
300 to 6000 gal. Glass Lined Tanks.
Premier Colloid (Paste) Mill, 7½ H.P.
Model 1SH Mikro Pulverizer, 5 H.P.
125 to 1500 gal. Homogenizers or Viscolizers.
Size B-3 Leiman Vacuum Pumps, 12.7 C.F.M.
Model 148C Stokes High Vacuum Pump, 1½ H.P.
Ingersoll-Rand Centrifugal Pumps, 5 & 7½ H.P.
Tri-Clover S.S. Centrifugal Pump, ½ H.P.
50 ft. 2" x 10" Roller Gravity Conveyor.
28" x 60" to 42" x 120" Double Drum Dryers.
Hobart Grinder, 1½ H. P.
J. E. Smith & Son Vanilla Bean Chopper.
Model GS-20 Permutit Water Softener, 17 G.P.M.

Send us your inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
Murray Hill 2-4616

NEW NEVER USED

YEAST DRYERS FOR SALE

Due to a change in plans, we have a brand new Double-Drum Yeast Dryer, never used nor installed, complete with flaker, conveyors, steam trap, extra set of knives, 60 cycle, 220 volt, 3-phase AC motors; capacity 375 lbs. of wet yeast per hour, still in the original crates; offer subject to prior sale but inspection invited; immediate delivery.

FS-9702, Food Engineering
330 W. 42 St., New York 18, N. Y.

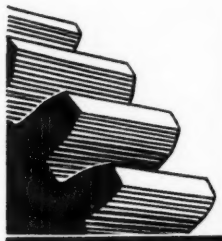
SALE

Pneumatic Scale Co., Automatic Cartoning Line Feeder, Bottom Sealer, Liner, Filler, Top Sealer & Compression Unit. 30 per minute.
Can be inspected in Philadelphia
Offered as is, where is, subject to prior sale
Asking Price $5000.00

FS-9672, Food Engineering
330 W. 42 St., New York 18, N. Y.

Ball & Jewell #0 Cutter with Savage Feeder feed and discharge hoppers
1500 Gal. S.S. Oval Horizontal Tank
2000 Gal. Alum. Oval Horizontal Tank
World Semi-Automatic Labellers
World Automatic Labeller
Burt Automatic Can Labeller
Meyer-Dumore 8 wide, Bottle Washer
Adriance 24 Spout Beer Filler and Crowner
24"x20' Stainless Wire Mesh Belt Conveyor
Stainless, Aluminum, Steel, Jacketed Kettles

CROWN MACHINERY COMPANY
2323 No. Ninth St. St. Louis 6, Mo.
Central 1313



READY-TO-WORK-FOR-YOU EQUIPMENT

Gear Up for Higher Production

The American processed food industry can feed the entire world. Do your part by increasing production immediately. Good used EQUIPMENT is available at once at reasonable prices. WHAT DO YOU NEED?

Stainless Steel Kettles and Tanks all sizes in stock

Swenson Continuous Evaporator in Stainless with Barometric Leg

2 Stainless Tumbling Batch Blenders; 23 cu. ft.

2 Hormann S. S. Pressure Type Filters; 24" x 41" body

Langsenkamp S. S. Model B EZ Adjst Pulpers; big capacity

Sharples Super Centrifuge with Stainless Bowl; 3 HP high speed

Large Stock of Canning Equipment Retorts, Labelers, Dicers, etc.

2 Stainless Spray Dryers complete with accessories; 6' x 15'; 18' x 52'

4 Horizontal Autoclaves with tracks; capstan closure; 66" x 14' 7"

3 Bird Young Rotary Vac. Filters; steel construction; 4' x 4'

6 J. H. Day Ro-Ball Sifters; sizes from 20" x 48" to 40" x 120"

Chisholm Ryder Model B, S. S. Juice Extractors; straight screw

Mikro No. 1 SH Pulverizer complete with double feed and motors

Dehydrators, Dryers. Ovens, Evaporators, Vacuum Cookers, Coolers, etc.

Your surplus or idle equipment can be working elsewhere for Defense. Turn it into cash by sending us your list.

FIRST MACHINERY CORP.

157 HUDSON ST. WOrth 4-5900 NEW YORK 13, N. Y.

IMMEDIATE DELIVERY

New Island Equipment Unscrambler.
2—Hormann 316 S.S. Pressure Leaf Filters, with 20-24" dia. Leaves. Like New.
2—New Sharples Super-D-Canters, type 316 S.S., with 10 HP motor, complete.
World Twin Turret Late Model Automatic Labeler. Like New, Complete.
7—Shriver Filter Presses, 12" to 42", Iron, Aluminum, Bronze, Wood & Rubber Covered.
Plaudler Steam Peeler, Complete. Late Model 2-6' x 7' Haveg Tanks, Like New.
S.S. Tanks & Kettles for immediate delivery.
Pneumatic Scale Duplex Labeler, Front & Back, with 1 HP exp. motor, 5" centers.
Elgin S.S. 2 Piston Filler & Burt S.S. Single.

For BETTER BUYS and SERVICE
Phone SOuth 8-4451 - 9264 - 8782
You can BANK on the

EQUIPMENT CLEARING HOUSE, INC.

289-10th ST., BKLYN 15, N. Y.

—FOR SALE—

2—#1 SH Mikro Pulverizers with motors.
1—#2 TH Stainless Steel Mikro Pulverizer.
2—Shriver Stainless Steel Plate & Frame Filter Presses, 12" x 12".
2—Sperry 24" x 24" Rubber-lined Filter Presses.
2—Shriver 36" x 36" Filter Presses, 25 and 36 Chambers.
2—Stainless Steel Jacketed Reactors, 550 gal. cap.
2—Stainless Steel Jacketed Autoclaves, 300 gal. cap.
2—Nickle Jacketed Kettles, 400 gal. cap.

R. GELB & SONS, INC.
UNION, N. J.

Est. 1886 UNionville 2-4900

"Buy Brill"—Buy the Best

2—Oliver 8' x 10' Monel Rotary Vacuum Filters.
2—Eimco 3' x 1' Stainless Steel (316) Rotary Vacuum Filters.
1—Proctor & Schwartz 7-section Conveyor Dryer.
2—Vallez #49 Filters, 738 sq. ft.
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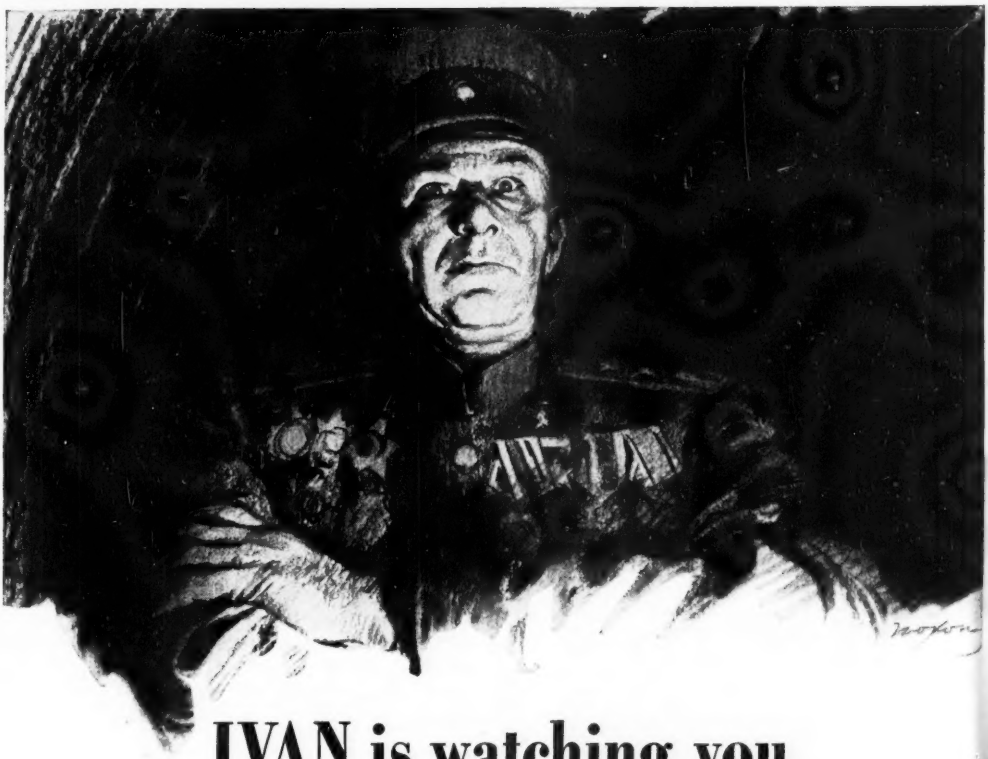

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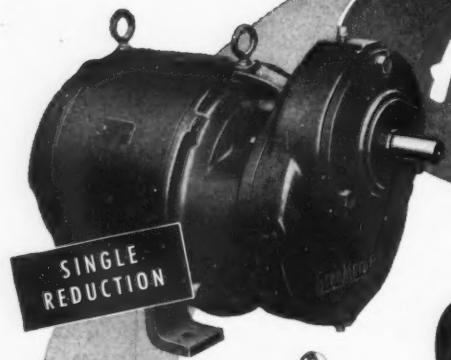

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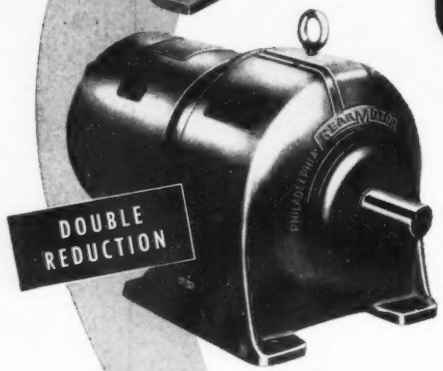

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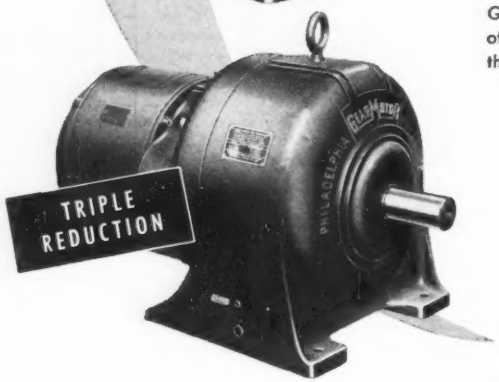

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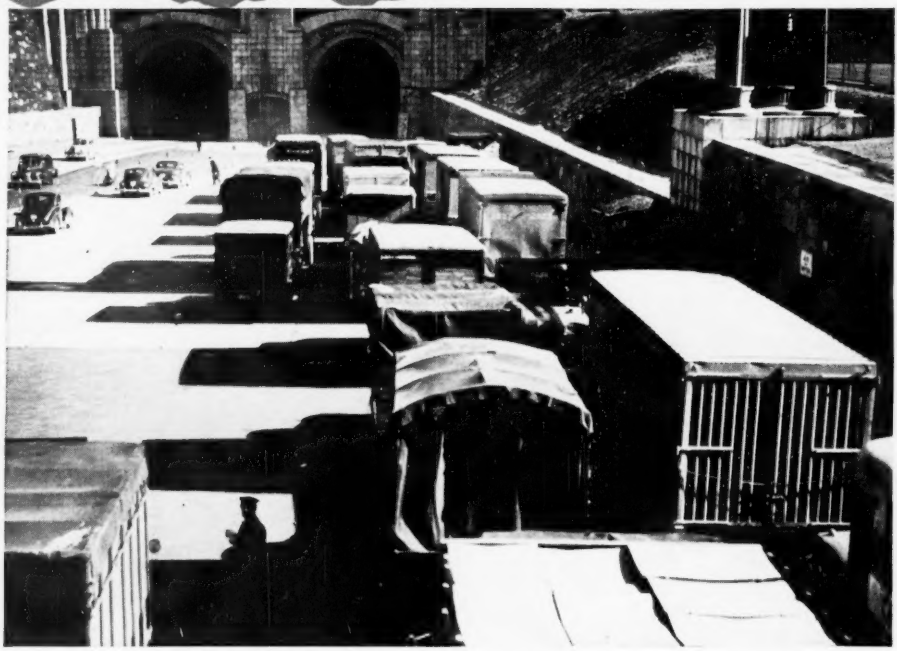

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